

NEUROSEXISM

-AND HOW TO PUT AN END TO IT. A FEMINIST INQUIRY

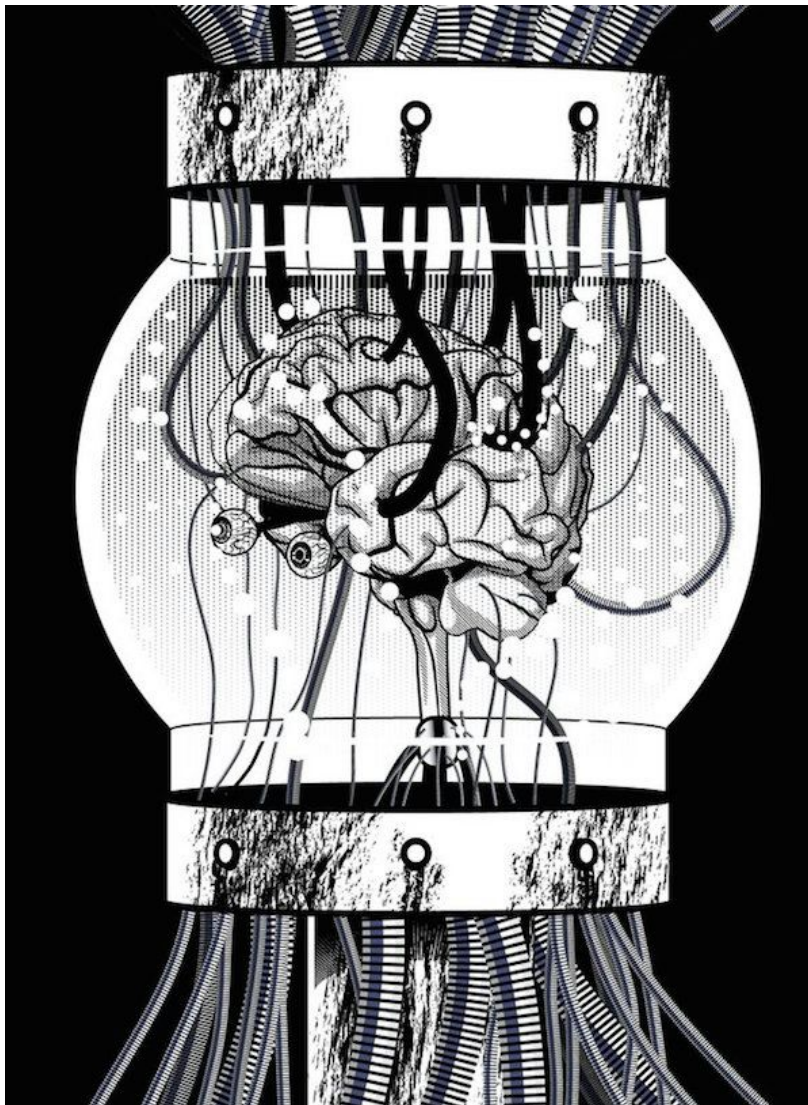


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Summary

This thesis addresses critiques of neuroscientific claims about innate and hardwired differences in male and female brains and investigates their normative implications. Neuroscience enjoys great authority when it comes to explaining human behaviour, not least due to its seeming objectivity. This thesis scrutinizes the methodology and implicit assumptions that leads to the brainsex theory. It problematizes its use of binary distinctions, as they function as both predictor and result in a way that obstructs paths to greater gender equality. By deploying poststructuralist feminist epistemology and concepts drawn from neuroscientific research to fashion an ethical response, I argue that the view - and language of differences, both neuronal and behavioral - can be dramatically transformed, making visible differences that have been obscured within a frame of comprehension that allows only two complementary - and ontologically different - sexes. In my conjunction of feminist theory with critiques from a variety of fields, including neuropsychology and biology, I investigate the potential of cross-disciplinary cooperation on the topic of sex/gender differences and human behaviour that might lead research to a different place and enable greater scope for culturally intelligible diversity.

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Introduction

“If history tells us anything, it is to take a second closer look at our society and our science.”

-Cordelia Fine

This thesis is a critical approach to some of the normative implications that derive from modern neuroscience.

Neuroscientific explanations for psychological and social conditions and phenomena have been gaining - and continue to gain - terrain, not least due to their seeming objectivity. Empirical methods such as MRI scans are being employed to map the functions of the human brain, and this comparatively new - and increasingly advanced - technology is giving rise to scientific claims that our actions, emotions and personal qualities are in some way determined by neural activity and properties of the brain. Looking closer, a majority of the scientists in question are in agreement that we are still nowhere near an actual mapping of the complexity of the brain as a whole, especially with regards to the task of ‘translating’ brain-activity into psychological conditions and functions, or put more simply: how the measurements of activity in the brain can be useful for explaining our behaviour(s). But as always, these obvious complications do not prevent prominent advocates of biological determinism from taking highly-charged conclusions into the public sphere, at which point popular culture takes over and the research results are debated and defended on weak grounds. This forms the basis of the main critique made by academic psychologist Cordelia Fine in her book *Delusions of Gender* (2010). Here she meticulously work her way through a large body of state-of-the-art neuroscientific research on sex differences in the brains of men and women. I will be using the term brainsex as a concept referring to the *“development of anatomical and functional brain differences in male and female fetuses, leading to sex-related differences in behavior after birth”*¹(Fausto-Sterling 2012: 28). Fine examines the methods applied and offers different frameworks for further inquiry into the evidence presented for the biological “hardwiring” of men’s and women’s brains - evidence that, if accepted, makes us fundamentally different from one another.

¹ Which involves a scientific use of the term in three basic ways that are not mutually exclusive: measurable anatomy (for example that males, on average, have larger brains than females), brain physiology, and behavioral differences *attributed* to brain function (Fausto-Sterling 2012: 30, my italics). Note the speculative characteristic of the latter.

In extreme cases, neuroscience is thought to promise a scientific future in which we can completely avoid speculative philosophising about fundamental questions related to the nature of human existence, a kind of materialistic reductionism that overcomes the ancient debate concerning materialism vs idealism within the philosophical tradition. If we accept the human body as matter - as an objective fact in the world - are we then obliged to accept and embrace an account of ourselves in which the self is an organism ultimately dictated to by the brain? How can we object to this account from within the science of the humanities without falling into the trap of *cultural* determinism, that seems just as counterproductive as biological determinism? This, of course, assuming that we seek possibilities for agency that bear the potential for a change in the world. But looking at structural inequalities between humans as they persist and are reproduced in contemporary discourses, I don't see why we would not.

When a newborn emerges from the womb into its always already cultural reality, or in many cases even before this event, the first difference noted by its surroundings is the sex/gender of the child. This is true for every culture in every region of the world, and obviously vaginas and penises are not socially constructed; they are, of course, real. History speaks its clear language on the matter of the oppression of women, and while a good few of us, fortunately, can agree that inequalities and violence of the past were monstrous and unjust (even those who believe that women were - and perhaps still are - inferior to men), the idea that men and women are fundamentally different is still the norm that rules the discourse. The latest scientific efforts to prove just how and what this might entail must be investigated with critical attention to how and what such a theory produces and maintains, what is left out, and whether it points towards a sustainable future for gender equality.

Reading *Delusions of Gender*, it occurred to me, that many of the points Fine generates throughout the book bears some resemblance to points made by queer-feminist theorist Judith Butler, though they share no kinship in either field of study or style of writing, and are not concerned with each others work. However, it seemed to me, that poststructuralist accounts of categorization and power - and particularly Butler's notion of the 'Heterosexual Matrix' (as discussed in *Gender Trouble* 2007) - offer a strong epistemological frame for a deeper understanding of power-relations in the social sphere. When we accept the premise of brain plasticity, that is, that brains develop and evolve *in relation* to and with environment,

as most do², then it seems scientifically irresponsible to deny a scrutinization of how 'culture' - at the very least a co-constituent part of reality - can be said to 'assist' materializations of sexed brains and bodies. This, I argue, require a philosophical framework for certain key-concepts such as 'Matter' and 'Construct' in order to capture what is really at stake at an epistemological level. So it would seem that one of the tasks at hand is to investigate the possibility of joining Fine's neuropsychological research with Butler's philosophical inquiries on subject and subjectivation and the relation between matter and construct. In other words: Brains and bodies are real, material facts, but how do they come into existence as sexed? How does sex *materialize*?

Investigating the legitimacy of popular neuroscientific accounts of sex differences is not an attempt to reestablish 'The Great Divide' by disregarding such claims as essentializing practices and thus point to neuroscience as the 'new enemy'. Rather, it expresses a concern as to how these naturalistic accounts of gendered identity can affect the discourse, insofar as this division of the sciences is sustained. The question of how neuropsychology and philosophy can learn from - and inform each other - seems much more constructive.

"We need the power of modern critical theories of how meanings and bodies get made, not in order to deny meanings and bodies, but in order to build meanings and bodies that have a chance for life" (Haraway 1988:580).

What can we know? And how can we build on this knowledge? These questions inevitably lead to question of ethics, as the Donna Haraway quotation so beautifully suggests. Now, 'ethics' covers a broad scale of considerations when related to science. In the case of conducting laboratory experiments, for instance, we have laws to protect humans, and to some extent animals, from 'unethical' treatment. However, what I am interested in here are the ethics of science that aim to secure *good* science. I want to draw attention to normative implications that go unspoken, and critically examine methods for collecting scientific data - and, of course, the validity of the conclusions drawn. Here, a feminist take on ethics can contribute constructively through discussions on ontology, epistemology and materiality.

"how we understand and interpret and work with difference in neuroethics will have a hand in the material differences of sex, gender and sexuality that are produced and that we come to know through neuroscience" (Roy 2012: 220).

² *"For several decades neuroscientists have documented the whys and wherefores of neural plasticity. Existing neurons change their connections; new neurons are born, and all this happens as a result of how the body interacts day to day in the physical world"* (Fausto-Sterling 2012: 63).

To me, thinking about ethics in science necessarily points to the controversial question of underlying ideologies - controversial because ideology is by definition politically motivated, and clashes with representations of natural sciences as evidence-based and objective. And controversial because, within the present day political landscape, it would seem that the term 'ideology' only gets employed for the sake of signifying totalitarian variants of extremism (the ideological Other) in a Western discourse that treats 'democracy' as its natural, ahistorical, and legitimate core. This rhetorical move is an effective way of manufacturing an account of Western democracy free of the incriminating -isms of the past (and hence of the connotations associated with them) while the ideology of (neo)liberalism that motivates and explains such rationale, lies silent and concealed in the narrative of 'Us' (read: the West) and how we came to be. However, if we subscribe to the notion of knowledge - and the production of knowledges - as something always already situated within relations of power, and thus that 'objectivity', in any traditional meaning of the term, is an utopian ideal, what naturally follows is the importance of considering what ends we as societies are *striving* for, and by which means. If notions of 'equality' and 'freedom of choice' bear significant value (and I dare say, any defender of 'democracy' would agree that they do), then we need to address questions about what these otherwise empty signifiers mean *to us*, at this stage in history, and develop thoughts and policies that have the potential to bring about changes that enable effects on people's lived realities. Science in all its forms will have to play a great part in achieving such goals. The normative implications of a continued scientific effort to reassert gendered identity as a process that ultimately originates outside culture, support the structural hierarchy within which existences that cohere with oppressing norms are encouraged and justified by excluding those that are not. Not only does that have devastating consequences for those many lived identities that do not already reflect the binary system of gender categorization (the two-sex/gender system), it has a paralyzing effect on the effort to expand the realm of possibilities for future identities that without such rigid and restricted frames available for identification, might bring the feminist project further than we are now capable of imagining.

(Femi)science

"[...] the science you do depend on the model of the body you start with"

(Fausto-Sterling 2012: 63).

My knowledge of the field of neuroscience and neuroresearch is fairly limited; my interest springs from reading critiques of it together with a deep-felt urge to contest any stable notion

of 'natural sex' whenever it appears. Fine's book is one that I found excellent in doing exactly that, and, intriguingly, her critique is operating on the premises of a science that she herself is intimately familiar with. Fine does not pay any attention to philosophical inquiries into ontology or epistemology, she is merely concerned with the quality of the research that she is investigating, and whether it is 'good' science, i.e. whether the methodology applied withstands scrutiny, and whether the conclusions drawn can be defended. The seemingly 'social-constructivist' points on 'human nature' that she is making throughout the book, do not come from a poststructuralist standpoint/epistemology - nowhere do we find references to a Foucauldian notion of power or a discussion of 'the subject'. They appear as valid scientific conclusions drawn from a body of research that Fine elucidates and urges us to take into account before jumping to hasty conclusions about so-called hardwired sex-differences. As a scholar of philosophy, it is impossible for me to discuss certain kinds of evidence-based research results, without looking to underlying and silent assumptions that form the premises for speaking of things in a certain way. It always seems possible to introduce a theory or thought-experiment in which a different history of an object of thought would change the object itself. As a scholar of philosophy, I also find my argumentations repeatedly brushed aside as 'radical meta-nonsense' when discussing such matters outside my community of interests. 'Hard facts' about the reality in which we are located are sometimes presented in a way that crosses the line between the descriptive and the normative without this move being questioned as it should.

"the seductive nature of neuroscience creates a dangerous situation in which it may not be the best research that wins debates in the public sphere. [...] The effects of neuroscience may be personal as well as political. Gender stereotypes are legitimated by these pseudo-scientific explanations. Suddenly, one is being moderns and scientific, rather than old-fashioned and sexist" (Fine 2012: 172).

Fine contributes with concrete scientific answers to concrete scientific research results. The critique, as I see it, is feminism within a scientific practise, and it is extremely valuable, not only on its own, but also as a strong practical supplement to more theoretical branches of feminism, not least in a public sphere where 'hard facts' are generally valued a lot higher than 'speculative theorizing'. It may be "*hard to argue with an MRI*" (Fine 2012: xvi), but it is - or at least it should be - equally hard to argue with a body of scientific research that undermines the very preconditions of what is being observed by the use of MRI.

Research Question

How can feminism provide an ethical response to neuroscientific claims about hardwired sex differences in the brain?

Part I

The Fine Critique

“Where else but in the brain would we see the effects of socialisation or experience? -How else would socially constructed differences manifest themselves?” (Fine 2012: 170).

So: on to the question of hardwired differences in the brains of men and women. One of the most prominent advocates of hardwired sex differences - and someone subject to consistent criticism throughout *Delusions Of Gender* - is professor of developmental psychopathology, Simon Baron-Cohen. Drawing from his book *“The Essential Difference -Men, Women, and the Extreme Male Brain”* (2003), some of his main claims can be summed up as following³:

1. On average, men and women differ psychologically. Men have an advantage when it comes to systemizing, and women have an advantage at empathizing.
2. These differences are biological in origin, as is demonstrated by studies of neonates and correlations between psychological traits and fetal testosterone.
3. Systemizing and empathizing give rise to different kind of cognitive abilities. Men and women have different, but equally valuable, intellectual skills. Neither gender is more intelligent than the other.
4. However, the male superiority at systemizing leads to male superiority in science and in innovation (Levy 2004:315f).

I will be quick to state, that *Delusions of Gender* is not a counter attack on Baron-Cohen; Fine looks at a much larger body of research conducted and presented by a wide range of

³ As was done so by philosopher and editor-in-chief of the journal *Neuroethics*, Neil Levy (2004). Levy correctly adds a fifth claim: *“The psychological differences between men and women help explain the origins of autism. People with autism, who are primarily male, possess extreme male brains”* (Levy 2004: 316). I have left out this claim. I do not include questions about sex differences concerning people who are not generally considered ‘healthy’. Levy’s main objection towards Baron-Cohen’s findings are structured around the notion of ‘intelligence’ and how this concept, or empty signifier to use a term from discourse analysis, is defined (though unspoken) in Baron-Cohen’s work. I will return to this in a later chapter.

researchers, but I have chosen his claims as representative of the scientific discourse on sex differences in the brain that she is primarily contesting.

Fine does not dispute that differences occur on average (they do) but rather whether the claim that the differences are biological in origin holds, and most importantly, what the idea of biological differences *does* to the (male and female) mind. The implications of Baron-Cohen's claims are many, and are disturbing to a feminist project of emancipation. Moreover, as both Fine and Levy note, with this book, Baron-Cohen is reaching a very wide audience and his claims are likely to have an impact on the discourse of sex (Levy 2004: 315, Fine 2012: xix). The implicit notion of 'equality' is of the *different but equally valuable* kind (which Fine refers to as Equality 2.0), which does not seem to form a basis for equality in the sense of equal opportunities, be it in the workplace or in the home.

"On average, women's intelligence is best employed in putting people at ease, while the men get on with understanding the world and building and repairing the things we need in it" (Levy (2004) quoted in Fine 2012: xix).

So it is of greatest importance for research like this to come under intense scrutiny before accepting such differences as innate and unchangeable. The political implications of a notion of women as being - not unfairly - kept in the shallow end of a binary construction that necessarily makes them not *inferior* to men, but simply *differently structured*, are immense. The very first consequence that springs to mind is: questions of *privilege* seem to disappear from this notion of 'equality'.

In the following, I will highlight a selection of Fine's arguments; I will elaborate on them further in the analysis when comparing and pairing her claims with those of Judith Butler. Again, I must stress, that it is neither within my ability - nor within the scope of the thesis - to deal with the many technicalities that created the research results that Fine is discussing and comparing; Fine has already done that, and I am merely extracting points for criticism that I find crucial to implement in ongoing debates on sex differences. For the sake of creating a structure and overview, I will divide the argumentation under a number of sub-headers.

Male and Female Brains

"There are sex differences in the brain. There are also large (although generally decreasing) sex differences in who does what, and who achieves what. It would make sense if these facts were connected in some way, and perhaps they are. But when we follow the trail of contemporary science we discover a surprising number of gaps, assumptions, inconsistencies, poor methodologies, and leaps of faith - as well as more than one echo of the insalubrious past" (Fine 2012:xxvii).

Before digging into Fine's objections to the above stated claims, it is important to clarify, that the differences in brainsex that Baron-Cohen is labelling as 'male' and 'female', do not point to a reality where *every* biological female is also naturally the bearer of what he calls a female brain and *every* biological male is naturally the bearer of a male brain, but that on average, they tend to (Fine 2012: xix, Levy 2004: 316). So it is not a given that a biological female has an advantage for empathizing, since the research reports instances of biological men and women differing from their sex category when brain activity and test abilities for tasks requiring skills associated with structuring and empathizing are measured⁴.

There are a number of problems to be addressed in the male brain/female brain distinction, but it seems clear from the beginning, that by this division, normative ideals follow. Even though in this theory it is possible for a woman to have a so-called male brain - or a brain that is placed on the male side of the spectrum between extreme female and extreme male - Baron-Cohen seems to find the tendency for men to have male brains and women to have female brains strong enough to work as a valid explanation for the almost complete male dominance within the academic fields of maths, physics and engineering (Levy 2004: 316). Another problem arising from this division, is that it enables an operationalisation of language and thought that allows stable categories of men and women; this in turn, as Fine point out, lends itself conveniently to (for example) speaking of intellectually talented women as a deviance to the norm (Fine 2012: xx). This only serves to consolidate the norm in question.

As Fine goes through scientific attempts to demonstrate innate differences between the sexes, the issue of norms and the question of the constitutive force of norms constantly surfaces and works against any assumption that the brain with which a human being is born (assuming here that we are talking about brains within a spectrum of what is considered a 'normal', i.e. abled brain), should also play the dominant role in the forming of personality, identity and abilities.

Brain Differences = Mind Differences?

This question of whether differences between brains causes differences of the mind leads to many sub-questions in a philosophical inquiry. First one could ask if the brain and the mind

⁴ To diagnose the brain sex of a person, Baron-Cohen uses an Empathy Quotient questionnaire (EQ), and the Systemizing Quotient questionnaire (SQ). Briefly, scoring high on the EQ means one has a female brain and scoring high on the SQ means having a male brain (Fine 2012: 17). Other ways of measuring these skills include visual-spatial tasks like Mental Rotation Performance, which is regarded as the most reliable gender difference indicator in cognition, and the ability to match a face expression of a stranger (viewed on a screen) with a feeling.

can be said to be identical? It certainly seems like that is what the idea of male and female brains' different capacities entails, and it does suggest a biological determination of gender identity. At its simplest, it can be said that men and women's' different brains are *causing* them to act differently. But such accounts of gender difference do not incorporate well-established notions of brain plasticity (or neuroplasticity), that refutes this one-way causality, because neural structures - our brains - change along with changes in our environment (Fine 2012: 236f). Culture becomes embodied, quite literally, as social phenomena "*becomes part of our cerebral biology*" (Kaiser (2009) in Fine 2012: 236⁵). Brains are both biology and environment and there is no obvious and clear line that separates them. Indeed, even in the case of *genes*, environment has a notable impact. The genetic material, the DNA that one is born with, normally does not change in response to the environment, but gene *activity* does change depending on surroundings:

"[G]enes switch on and off depending on what else is going on. Our environment, our behaviour, even our thinking, can all change what genes are expressed. And thinking, learning, sensing can all change neural structure directly. [...] one important implication of this neuroplasticity is that we're not locked into the obsolete hardware of our ancestors" (Fine 2012: 177).

Such scientific discovery upsets the idea of biological hardware. Not that it rids the body of certain innate properties, but it highlights their potential for expression rather than determines expression. What we are biologically equipped with is not necessarily put to use, and unused hardware remains switched off as the utilised hardware is expressed. We cannot therefore draw a straight line from a notion of an 'original human' (whoever we decide that is) to the 'present day human' (same problem) because the conditions under which those imagined archetypes are situated are dramatically different.

Fine looks to research on cultural impact on the sense of self (how a person views him/herself in specific situations where gender is salient in one way or another, implicitly or explicitly) and devotes a great deal of space to covering studies that investigate what I will now treat under the terms *Implicit Mind* and *Stereotype Threat*. What happens when gender becomes salient in the environment?

Implicit Mind

This term comes from social psychology and describes a part of human consciousness that works automatically and unintentionally when we are presented with certain stimuli. Various tests show which associations are automatically operationalised in our minds at an implicit

⁵ Citing the insight of Fausto-Sterling (Fine 2012: 287, note 11).

level, and they show that the things we consciously report about ourselves and others do not tell the full story of what is really going on (Fine 2012: 4f). The *implicit associations* of the mind consists of “*a tangled but highly organised network of connections. They connect representations of objects, people, concepts, feelings, your own self, goals, motives and behaviours with one another*” (Fine 2012: 4). Each connection depends on past experiences and the more one has experienced a connection, for example the presence of an object or a word combined with a certain behaviour, the stronger it gets (Ibid). We learn these association from - and in - the environment and constantly accumulate *associative memory*, a process that goes on without us needing either awareness, intention or control in order for it to take place (Fine 2012: 5). A multitude of studies shows that the unreflective associations (implicit attitudes) we make are a lot less critical about what we pick up from surrounding culture, including media and advertising, than what we in a conscious frame of mind are willing to accept. In fact it shows that “[...] *our implicit representations of social groups are often remarkably reactionary, even when our consciously reported beliefs are modern and progressive*” (Fine 2012: 5). Now, gender stereotypes are automatically primed whenever we categorise someone as female or male. A somewhat more tangible example of implicit attitude toward men and women’s abilities, are the measures of implicit associations that shows how men are frequently associated with high authority, hierarchy, career, science and maths, while women, in contradistinction, are implicitly associated with low authority, egalitarianism, family and domesticity and liberal arts (Fine 2012:5f)⁶. Interestingly - though scarily, I must admit - it seems that even the most subtle gender priming⁷ not only leads us to associate others with gender stereotypical characteristics, but alters our self perception too. It shows, that people “*socially ‘tune’ their self-evaluations to blend with the opinion of the self held by others*” (Fine 2012: 10). The self is not a self-relying entity; it is active and changes with different surroundings. Social identities help us to perform current social roles in ways that make us fit in. The ‘male self’ and the ‘female self’ are social identities that can be useful for achieving that acknowledgement from our surroundings, “[B]ut *flexible, context-sensitive and useful is not the same as ‘hardwired’*” (Fine 2012: 13).

⁶ I personally took several of the Implicit Associations Tests available from the Harvard website (<https://implicit.harvard.edu/implicit/takeatest.html>) and found that my own implicit attitudes are very much in accordance with the gender stereotypes that Fine here describes.

⁷ Fine presents a range of studies applying different methods for priming gender, one in which a group of students was divided into two, one group being directly primed with gender stereotypes before rating their own abilities, while the other was not. Those in the stereotype-salient group altered their memories of their own achievements to better fit the stereotype, while the other group did not. Another method simply consisted in having students note their gender before rating their own skills, which led to the same results. For a more detailed description, see Fine 2012: 7-13.

Stereotype Threat

- Or social identity threat, is a term coined to cover the “*real-time-threat of being judged and treated poorly in settings where a negative stereotype about one’s group applies*”⁸ (Fine 2012:30). Fine goes on to demonstrate how cultural bias towards women⁹ has an effect of double-punishment in particularly male-dominated settings and sows doubt about what actually comes first: women’s inabilities in certain environments, or hostile environments in which women are (historically) *thought of* as less capable? We measure and get measured against stereotypical representations all the time, even when this process goes on unintentionally and without our awareness. Fine speaks of *the female mind under threat* in reference to settings and situations where her gender alone, with no regards to her specific experience or abilities, becomes a social obstacle for obtaining her goals (Fine 2012: 31, 32, 33). And if she has chosen a profession within a traditionally male dominated trade such as maths or ‘hard’ science, not least her work related goals. Working against the stereotype takes strength and energy¹⁰. Fannie Hurst once said that a woman has to be twice as good as a man to go half as far - a statement that has a depressing actuality to it still, despite a political landscape where equality is generally celebrated and promoted as a social good. Through a series of studies¹¹ on negative gender bias towards women in ‘male-professions’, it is shown how subtle triggers for stereotype threat create an environment that not only provides a setting in which the female mind is under a lot more pressure than the male minds of her colleagues, but also one that seems to scare females away from pursuing careers within these environments (Fine 2012: 44-48). Somewhat paradoxically, it is the subtle cues of gender stereotypes that bring about discriminatory practises that - because they are harder to pinpoint and take direct action against - become socially acceptable and part of defining the work environment (Fine 2012: 32). Blatant discrimination does indeed pose mental and physical threats to women (amongst others). However this sort of behaviour is typically more directly frowned on and creates a much clearer sense of ‘perpetrator and victim’ that can be acted upon. Fine suggests that this makes stereotype

⁸ Quoting Steele, Spencer, and Aronson (2007) (Fine 2012: 251 note 10).

⁹ Obviously, other cultural variables are subjected to stereotype threats; the burden of representation rests heavily on most non-white-male groups in settings where white-male supremacy prevails. Class affiliation is yet another one. Studies researching the effects of priming gender *and* race are mentioned in *Delusions of Gender* (examples; Fine 2012: 9,183).

¹⁰ Suppressing negative stereotypical thoughts and concepts (like ‘irrational-woman’) has a negative effect on performance, because “*[...] suppressing unwanted thoughts and anxieties uses up mental resources that could be put to better use elsewhere*” (Fine 2012: 33).

¹¹ The entire chapter *Backwards and in high heels* (Fine 2012: 27-39) is spent on these, especially the research of Good, Aronson and Harder (2008 in Fine 2012: 30-31) and Logel (2008 in Fine 2012: 33).

threat more of an issue for women in modern societies (read: with egalitarian self-perceptions) than it was earlier, when denigrating female ability was in accordance with hegemonic discourse (Ibid).

Stereotypes are culturally produced phenomena, not a fixed property of brain structure. When they work as threats in social situations, they impair performance and reduce interest in cross gender activities. Fine sheds light on how these effects potentially form a fully circular argument, where the claim to biologically originated sex differences in the brains of men and women becomes a self fulfilling prophecy.

On average, women tend to score higher than men on tests designed to measure empathic abilities and lower than men on systemizing ability tests. But what does that really entail in terms of hierarchy and division of work (in the home as well as the workplace)? Is the woman *naturally* endowed with a brain that *causes* her to nurture and care for other people, or is it that the positions available to her are restricted by gender norms that she socially attunes to, incorporates, and acts according to? When men perform slightly better at systemizing tasks, is that necessarily a sign of their superiority in certain faculties, or could it have something to do with a culture that promotes these abilities as 'masculine' and provides men with settings in which they do not have to worry about negative stereotypes working to their disadvantage? Does the brain structure behaviour or does behaviour structure the brain? The brain forges new connections and develops better ability every time it practices a task (Fine 2012: 185), which suggests developmental malleability as a trait of the brain. Obviously one can not say that every person has the same starting point from where they learn, but it does matter if it is in fact *"[...] cultural factors that affect the extent to which [mathematical] talent is identified and nurtured, or passed over, stifled or suppressed in males and females"* (Fine 2012: 184).

"[...] we can't understand gender differences in female and male minds - the minds that are the source of our thoughts, feelings, abilities, motivations, and behavior - without understanding how psychologically permeable is the skull that separates the mind from the sociocultural context in which it operates. When the environment makes gender salient, there is a ripple effect on the mind. We start to think of ourselves in terms of our gender, and stereotypes and social expectations become more prominent in the mind. This can change self-perception, alter interests, debilitate or enhance ability, and trigger unintentional discrimination. In other words, the social context influences who you are, how you think and what you do. And these thoughts, attitudes and behaviors of yours, in turn, become part of the social context. It's intimate. It's messy. And it demands a different way of thinking about gender" (Fine 2012: xxvi).

In Utero

One of the major topics in neuroscientific research on brain sex is the effect of testosterone on cognition. The levels of this hormone in the womb are crucial for the development of male

genitalia, and one of the appeals of this theory is the promise of data - insofar as the methods applied for measuring can be agreed upon - that can tell us something about sex differences in a seemingly pre-cultural setting (the womb¹²) (Fine 2012: xxi). For Baron-Cohen, the correlations between high levels of foetal testosterone and male cognition (i.e. less signs of cognitive empathy and a higher degree of systemizing skills¹³) serve as proof that prenatal testosterone plays a significant part in organizing the brain (and causing the male brain to have *a priori* advantage for understanding systematic information, such as mathematics) *in utero* (Fine 2012: 100). Biologist Anne Fausto-Sterling, in referring to this idea as a 'hormone-brain-identity nexus' (Fausto-Sterling 2012: 46), states that:

"The idea that prenatal hormones affect brain development in some manner that influences gender identity formation remains a favorite hypothesis despite lack of direct evidence or the elucidation of a specific developmental pathway to support it" (Fausto-Sterling 2012: 45).

Efforts have been made though, but not without severe methodological difficulties¹⁴. For further information about how prenatal testosterone affects behavior, both Fine and Fausto-Sterling turn to research on *congenital adrenal hyperplasia* (CAH), a condition that stems from a foetus being exposed to unusual high levels of testosterone¹⁵ (Fine 2012: 119, Fausto-Sterling 2012: 46-49). Studying behavior in females with CAH is an opportunity to explore the high-testosterone thesis at a safe distance from the usually accompanying condition of being male. The results suggest correlations (Fausto-Sterling 2012: 47), but no causal chains or direct pathway from prenatal testosterone to sex-typed behavior or preferences have been identified. It seems impossible to generalize the thesis.

¹² I write 'seemingly' because even if it is true that a foetus has yet to be met with gender-based expectations as it develops in the womb, surely the body that it inhabits is affected greatly by environment in ways that can have considerable effects on a developing foetus' neural connection and hormonal balance. Off the top of my head I can mention stress, violence, medicine/substance intake (alcohol and drugs included), (lack of) nutrients, pollution, and (lack of) exercise.

¹³ The extreme cases, he claims, is what is valid for autism, a diagnosis most frequently made on males (Levy 2004: 316).

¹⁴ Researchers cannot directly measure the testosterone in the unborn baby's blood. Instead they can either A: measure testosterone levels in the blood of the pregnant woman, B: Measure the amniotic testosterone in the fluid that surrounds the unborn child, or C: Study adults and use digit ratio. The latter describes a method based on the fact that, on average, men tend to have a longer ring finger relative to index finger while the opposite is, on average, true for women. The idea suggests that prenatal testosterone levels has an influence on digit ratio (Fine 2012: 108). Fausto-Sterling labels such research "quasi-experiments" (Fausto-Sterling 2012: 46).

¹⁵ In girls, this results in development of male external genitalia though the female internal reproductive organs develop normally (Fine 2012: 119f).

[...] it remains unclear whether this [that women with CAH reported weaker identification as females] means that early androgen¹⁶ exposure masculinized gender identity - the sense of oneself as female - or merely increased dissatisfaction with a more feminine role" (Fausto-sterling 2012: 47).

The difficulties seem to emerge from the entanglement of what female - and male - brains might show interest in (preferences) with what is *socially* ascribed to the sexes, which strips the claim of any real evidence that early hormonal influences on neural development are preserved in the adult human being. On that note, it is interesting to observe, as Fine does, that the effect of levels of testosterone on cognitive performance, when linked to the drive to gain and maintain status¹⁷, actually works *against* high-T women in social and professional situations in which high-T men are likely to benefit from the exact same trait. This has to do with the aforementioned stereotype threat, that positions women with a lower status in the dichotomous hierarchy. High-T women will, according to this theory, be more concerned with status and thus more vulnerable to the stereotype threat than low-T women (Fine 2012: 38). As we saw, gender bias in the workplace works both explicitly and implicitly. The stereotypical 'woman' that actual females are measured up against, is well adjusted to her social role, which does not involve demonstrating traits like confidence, ambition and competitiveness (Fine 2012: 58). Status enhancing behaviors, like being aggressive, intimidating, and dominating work for both men and women in theory, but in practice women demonstrating these traits in professional life¹⁸ run the risk of being 'liked less' and thus face social sanctions¹⁹. "*The same behaviour that enhances his status simply makes her less popular*" (Fine 2012: 63).

Ethics

"As this research trickles back into society, people will turn away from social and structural explanations of gender differences. They will give up the idea of further social change. And, to help the belief in the inevitability of inequality come true, workplace discrimination against women will increase" (Fine 2012: 186).

¹⁶ The term 'androgen' is actually more accurate than 'testosterone', because "*testosterone is one of several very similar hormones secreted from the testes, ovaries and adrenal glands, known as androgens*" (Fine 2012: 101). However, Fine continues to use the term 'testosterone', most likely because it is better known. I will follow her in doing so.

¹⁷ Research suggests that both women and men with high testosterone are cognitively at their best in situations where status is to be attained or maintained (Fine 2012: 36f).

¹⁸ For studies and research that support this claim, see *Delusions of Gender*; chapter 5; *The Glass Workplace* (Fine 2012: 54-66).

¹⁹ A kind of 'damned if you do, damned if you don't' situation because the result of **not** demonstrating such traits can be the assumption that she lacks ambition etc, a situation that Fine exemplifies by a simplistic account that only allows two positions; 'competent but cold' or 'nice but incompetent' (Fine 2012: 58), based on research suggesting that 'warmth' and 'competence' are fundamental dimensions of social perception (Fiske, Cuddy, & Glick, 2007 in Fine 2012: 255, note 15).

Neuroscience has, no doubt, contributed substantially to our knowledge of what is going on inside our heads. But it is abundantly clear that data coming from a science that is still in its infancy must be handled with utmost care. The complexity of the brain makes it an easy site for speculative theories of possible chains of causality that, in the case of hardwired sex differences, may turn out to be nothing but “*sexism disguised in neuroscientific finery*” (Fine 2012: xxviii). *Neurosexism* (a term coined by Fine to define this phenomenon (Ibid)) is a powerful support²⁰ for a highly dubious revision of a ‘gender-equality’ that does not seem to have much to do with being equal at all. And a cultural acceptance of the claims here accounted for may affect our attitudes, performance and sense of self, precisely - and by the same mechanisms - as the activation of gender stereotypes does, even in their most subtle form. The fact that the brain develops and evolves in interplay with culture, means that; “*looking for sex differences in the brain is hunting a moving target*” (Fine 2012: 236). And perhaps science is *looking for* the wrong things?

Neuroethicist Deboleena Roy²¹ poses questions to the findings of sex differences in the brains of men and women that ought to be considered here, as she reminds us that “*the goal for neuroethicists should be to guide neuroscience research to a different place (instead of chasing well-established stereotypes) - so that we do not once again tread that well beaten path of biological determinism or bring forth a materiality that is marked by superiority and inferiority*” (Roy 2012: 225). Her concerns about the power of neuroscientific pseudo-explanations for social inequality is much in line with Fine’s, however she goes on to formulate a set of questions that anticipate the cases of difference that inevitably will turn up in the scientific research on the matter of our brains and bodies. They keep a sharp focus on how we recognize differences and how we name them (Roy 2012: 225). Roy suggests being attentive to underlying assumptions by posing following questions:

1: *is difference being measured in the study for the purpose of understanding difference in and of itself, or is it being measured for the purpose of division?*

2: *does the study demonstrate an appreciation for biological complexity, or in other words, is there enough difference?*

3: *does the study assume that structural differences can be conveniently translated into functional differences?* (Roy 2012: 220).

²⁰ Another term, ‘neuro-realism’, describes how psychological phenomena are perceived as more objective and real through MRI coverage than research done using more traditional ways of collecting data (Fine 2012:170). Studies show that people tend to exercise a greater degree of approval for scientific arguments when these are shown together with images of brain activation, even when the argument is circular and without actual meaning (Fine 2012: 171f).

²¹ Associate Professor of Women's, Gender, and Sexuality Studies and Neuroscience and Behavioral Biology at Emory University.

The refusal of those binary distinctions that are often sustained in scientific studies are essential to the feminist critique (that is, in itself, essential to ethics of science), but in order to enable actual development, we need questions of *shared perplexity*, that is: feminist theory put to practise in neuroscience (Roy 2012: 218). In other words, one might say that in order for the deconstruction of the binary system that upholds claims linked with sex-differences to have any practical (political) value, a 'reconstruction' must follow: one that involves the process of reorienting ourselves to the matter and world around us:

"From a feminist science studies perspective, this understanding has both ontological and epistemological implications, and changes our grasp on materiality. The issue here is not only the politics of measure as such, but also the politics of meaning. Our engagements with the neurosciences must therefore begin with the question of how we bring forth difference, and this in itself is the beginning of an ethical response" (Roy 2012: 229).

It may prove impossible to solve all of the problems that arise from the deconstruction (and I suspect it will), but an ever growing attention to the problematic nature of stable categories and attempts to implement alternative perspectives (and use of language) will be crucial for the departure from the uncritical reproduction of difference for the sake of difference.

*"We need to develop more dynamic hypothesis and new experimental paradigms [...] one in which neural development results from initial behavioral exploration should **not** be on the agenda for the next generation of researchers"* (Fausto-Sterling 2012: 68).

Numbers Beat No Numbers

It is worth drawing attention to a well known and problematic term for science in a world dictated to by supply and demand. The 'file drawer phenomenon' - or 'publication bias' - refers to the selectivity by which some research gets published while other is ignored. Fine informs us that within psychology there is a general rule for the reporting of a difference between two groups. In order for the difference to appear 'significant', the probability that it has occurred by chance has to be minimized. If the probability of a result emerging by chance is 1 in 20 or less, the result is taken as valid (Fine 2012: 133). In research on sex differences this leads to an acute problem:

"[...] sex is easily assessed, routinely evaluated, and not always reported. Because it is more interesting to find difference than to find no difference, the 19 failures to observe a difference between men and women go unreported, whereas the 1 in 20 findings of a difference is likely to be published" (Hines²² in Fine 2012: 134).

²² Professor Melissa Hines; psychologist and neuroscientist with gender development as her area of specialization.

Not only does it mean that in some of the studies (statistically it would amount to five percent) reporting significant difference, the difference has occurred by chance. It also means that results from studies showing similarity rather than difference, will not be focussed on sex-difference (since there is none) and thus will not figure as sex-difference research at all (Fine 2012: 134f). In the case of neuroimaging studies (using MRI scans) this problem has a financial dimension to it that complicates it even further: The technology is very expensive. For this reason alone; “ [...] a small number of participants is the rule rather than the exception [...]” (Fine 2012: 135).

All in all, there are many pitfalls when studying sex-differences in the brain that could lead to misinterpretations of the subject. Single neuroimaging studies that report sex differences lack credibility; neuroscience should instead be looking for a consistent pattern (Fine 2012: 137). This may be a matter of looking for similarity rather than difference - new research, that I will present in a later chapter, clearly suggests that this is the case. I will later return to the world of neuroscience, but first I will turn to the theoretical outlook that in my opinion would provide future neuroscientific endeavours with epistemological and ethical guidance principles.

The Need for Theory

In 2008, the editor of Wired magazine Chris Anderson wrote a widely discussed essay in which he proclaimed the death of theory due to the emergence of the ‘Data Deluge’ or ‘Big Data’ as it is more commonly described. We live in the age of the peta-byte, he writes, and the amount of data that can be gathered and systemised using only mathematical algorithms has expanded so dramatically that it allows us to turn away from theoretical speculation. Anderson celebrates this moment in technological development:

“This is a world where massive amounts of data and applied mathematics replace every other tool that might be brought to bear. Out with every theory of human behavior, from linguistics to sociology. Forget taxonomy, ontology, and psychology. Who knows why people do what they do? The point is they do it, and we can track and measure it with unprecedented fidelity. With enough data, the numbers speak for themselves” (Wired 2008).

The main objection to theoretical models is that they are all flawed, which is arguably true. However, using Big Data as single formula explanations of matters of human behavior is to ignore the warning about the dangers of mistaking correlation for causality. In Anderson’s vision, correlation is enough (Wired 2008). If we, for the sake of argument, apply the method to neuroscience as outlined above, it would be a matter of performing a huge number of MRI scans, only looking for brain activity in a vast multitude of individuals without paying attention to the categories they take part in (sex, race, class, regionality, ability etc), derive

statistical correlations, and accept the most common ones as truth. The immediate appeal of such an approach is that there will be no need for the aforementioned analytical categories - contested and detested by many a poststructuralist analysis - in order to study and write about what goes on in the human brain. Social differences will not precede the study and anticipate differences that in turn inevitably show up in the research results as they are part of the model for investigation. In other words: because there are no expectations, the phenomena that appears cannot have been shaped and/or produced by prediction. Our findings avoid being funneled through inane stereotypes; the data is bias-free, which is why it is typically referred to as 'raw data'.

In response to Anderson, computer scientist Geoffrey Bowker discusses the need for theories, and theory's need for categories (Bowker 2014). What is at stake in the Big Data approach, he argues, is the understanding of *how* and *why* social truths come to be.

"If we accept the underlying ontology that we are all individuals (atoms) who aggregate in unnamed clusters rather than categories, then [...] we certainly lose the ability to recognize constant and meaningful forces in society" (Bowker²³ 2014: 1796).

Categories such as 'man' and 'woman' *represent* a reality. As political categories they make inequality visible by enabling us to speak of them and thus have an impact on ethical issues. Categories do not reflect an essence, but in the social world - in discourse - they have deep meaning and real consequences (for real people) (Bowker 2014: 1796f) and they will not disappear, no matter how big the data. Bowker argues that the promise of Big Data's doing away with categories is a false pretence: *"Every act of admitting data into the archive is simultaneously an act of occluding other ways of being, other realities"*²⁴ (Bowker 2014: 1797). The term 'raw data' is thus an oxymoron²⁵ (Ibid).

Furthermore, massive amounts of data do not naturally imply a database that is not theoretically structured. We might agree that we are all individuals, and that individual data can avoid categories theoretically, but even the term 'individual' does not represent a stable entity; individuals are not identical with themselves over time (just like brains) and a database structured by 'individual' thus excludes temporality (Bowker 2014: 1797). It would seem then, that even Big Data moves through theory, but in a way that loses sight of important questions about why certain phenomena occur. With regards to the brain/mind/psyche, the social/discursive processes between what goes in (stimulus) and what comes out (response) stay hidden and remain unproblematized. Furthermore, the

²³ Based on the insight of Slavoj Žižek.

²⁴ Citing the insight of Jacques Derrida.

²⁵ A term that juxtaposes elements that appear to contradict each other.

'occlusion of other realities' that is inherent to the Big Data approach means that some realities become invisible, simply because they fail to appear as statistically significant:

"The archive cannot in principle contain the world in small; its very finitude means that most slices of reality are not represented. [...] The hyping of big data leads to the withering away of interpretation - not through the actions of a cabal, but through a sociology of excluding from the archive all data which is not big" (Bowker 2014: 1797).

In sum, it is not the time to abandon theoretical hypotheses in science. We must maintain that correlation and causality are not synonymous with each other. We need theory to discuss why and how things and phenomena come into existence. It is the very understanding of the social world that is at stake - and subsequently the important questions of what kind of world is desirable and by which means we can draw closer to our ideals, or in other words: how to respond ethically to social injustice.

Part II

The Feminist Project

"Politics is about difference - its recognition, negotiation, suppression, constitution, exaltation, impossibility, necessity, scandal, and legitimacy. Gender is also about difference; it is the politics of the socialization of sex" (Haraway 1984: 492).

The theoretical framework in which I ground this thesis is structured around the endeavour to understand the claim to sex differences in the brain. I want to understand the implications of this claim via a broad inquiry from a perspective that accounts for the past in relation to now and to the future. Hence a genealogical approach to contemporary gender ontologies is appropriate, as this works as a tool to expose relations of power surrounding the production of the culturally intelligible, and in doing so, points towards alternatives for the future. I will draw on a range of thinkers from within a poststructuralist line of thought, designing my theoretical viewpoint for the task at hand. In order to discuss the possibilities for contemporary cognitive psychology and feminist analysis to cooperate in a proactive and progressive manner, I must first be clear about what I understand by feminism. Positioning myself through the explanation and utilization of selected feminist notions and concepts, will allow me to specify how I see them put to use within a discourse of science. Margrit Shildrick argues that the use of insights from a variety of disciplines and voices ought to be intrinsic to

feminism (Shildrick 1997: 5). Within the poststructuralisms, I think the interdisciplinary approach is exactly what gives the theory 'a foot in the world' or in other words makes a clearer conceptualization of philosophical theorization possible through incorporation of more context oriented work coming from social- and cultural studies as well as the natural sciences.

The importance of feminist critiques of - well, everything really - is evident to me. In the case of contesting biological fundamentalism, it is indispensable. Biological explanations for structural inequalities have met their greatest challenges from within feminist and poststructuralist lines of thought. The Simone de Beauvoir quote; "*One is not born a woman. One rather becomes one*" (Beauvoir 1965, 2: 13) marks a transition into a realm of thought in which a more constructivist perspective takes hold and the notion of 'identity' changes from a stable entity into naming the *process* by which a subject takes form within - and in exchange with - surrounding culture(s). When Beauvoir rhetorically asks about what humanity has done with the human female (Beauvoir 1965, 1: 65), it is indeed this artificial division between nature/culture she is challenging.

Yes, it is Politics

"[...] I see concepts and categories as shaped by political goals and intentions. Contests over the meaning of concepts, it follows, are contests over desired political outcome" (Bacchi, 1996: 1).

What Bacchi is clearly stating here is what I consider to be at the very core of the feminist project. Feminism is political activism that seeks to expose naturalized but inherently unjust hierarchies as a product of patriarchal culture, and in doing so, pave the way for politics that do not rely so heavily on fixed identity categories. Identity categories are never only descriptive, they are always normative (prescriptive) and thus excluding (Butler and Scott 1992: 16). The main aim of poststructuralist theory, is exactly a resisting of the fixity of specific meaning through the "*critical interrogation of the exclusionary operations by which "positions" are established*" (Butler and Scott 1992b xiv). The systems of categorization that are operationalized in and through language are heavily reliant on dichotomies and binaries. In other words: objects and subjects in differential relations to each other. The dialectics of a binary world view implies essentialization and homogenization of the respective and oppositional identities, and the arrangement of all experience in an interconnected societal totality (Hardt and Negri 2003: 149). Poststructuralisms, as I see it, come together in the agreement of the dismissal of this - imagined but persistent - idea of a world order.

Différance

The way we think about differences shape the world we inhabit. It installs and maintains hierarchies. It establish and naturalizes 'Firstness' and 'Otherness'. It supports systems of categorization that enable and restrict us in defining ourselves and everyone else, not only in relation to which categories one has a part in, but also those in which one does *not* have part. The way we think about differences does not come from nothing. They are not universally given or pre-discursive signified-signifier relations. The Derridean notion of *différance* encaptures this aspect of production of meaning quite brilliantly. It is a play on words that, translated into English, couples *difference* (a characteristic, more or less static) with *deferred* (a temporality, movement, and process that institutes difference) (Hughes 2002: 16). The deferral of meaning through *différance*, points the attention to the role and power of language in shaping understandings and to the temporality, and thus instability, of meaning (Hughes 2002: 13) - something that I would dare to call a basic principle of poststructuralism. When meaning is not stable, it is open to challenge. Herein lies the potential for emancipatory practises within the poststructuralisms, but it is important to stress that not all meanings are equally vulnerable to challenge. The degree to which they can be depends on the power of the discourse that produce and maintain them (Hughes 2002: 16). As the following shows, the meaning of sex as biological in origin is particularly powerful. The 'ontology of the sexes' as it is preserved and defended within the brain-sex discourse represents 'knowledge of the sexes' as something detached from the *history* of the knowledge of the sexes, which a genealogy exposes as a powerful discourse that needs to be challenged, if we are serious about striving for a greater degree of equality.

The Discourse of Sex

"No subject is its own point of departure" (Butler 1992: 9).

Thinking and talking about sex is then a process within language that (re)produces the categories that it expresses, and the linguistic categories employed for the purpose of granting cultural meaning are - then - in themselves a structure that takes part in forming reality. When meaning is always deferred and discourses operate as limits for what can be known, then the material body is also only known by the meaning it takes within a discourse (Butler 2007: 125). Later in this chapter, I will elaborate on the Butlerian notion of the

materialization of sex though the complex interplay of materiality and construct, but first we must turn to the signifier that is sex.

"The notion of 'sex' made it possible to group together, in an artificial unity, anatomical elements, biological functions, conducts, sensations, and pleasures, and it enabled one to make use of this fictitious unity as a causal principle, an omnipresent meaning: sex was thus able to function as a unique signifier and as a universal signified" (Foucault quoted in Butler 2007: 124).

As this quote suggests, 'sex', signifies a lot more than simply what type of reproductive organs you have. Drawing on Foucault means turning truths around in a way that elucidates the desired *effects* of 'truths' in a given historical context and thus viewing the motivation for specific outcomes (lived practices) as constituting the 'truth' itself. It is a way of saying that there can be no innocence in 'factual knowledge' as it is complicit with both material and discursive mechanisms of control (Shildrick 1997: 45). From this perspective, 'knowing the subject' is not a matter of defining it as an ontological being, but rather consists in an investigation of the mechanisms that make certain modes of *subjectivation* (lives) possible. In other words: to identify the disciplinary and regulatory relations of power and knowledge that condition the formation of what is culturally recognized as a (legitimate) subject and recognizable life. Cultural values plays a great part in the construction of the body and the relationship between the descriptive plan (knowledge of bodies in their materiality) coming from natural sciences and the prescriptive plan, where regulatory norms/ideals set boundaries for conceptions of the body, is what Shildrick²⁶ calls a symbiotic one:

"Though the dominant discourse may dictate certain conceptions of the body, those privileged conceptions are rarely acknowledged as such. What then appears to be reality in turn justifies and perpetuates particular truth claims" (Shildrick 1997: 45).

Privileged conceptions of the body become institutionalized representations of 'who we are' that act as the normative prescription for 'what we (ought to) do'. And what we do, in terms of expressing this ostensible identity-core that is essentially gendered, is invariably tied to sexuality and thus individual performance. So to look at the the 'truth of the sexes' as represented by the stable binary categorizations, men and women, leads to asking questions about its discursive effects, which then consists in looking to the normative ideals for the *conduct* of men and women respectively in dominant discourse. Fine shows us how gender stereotypes and biases work by establishing certain expressions and skills as gendered and setting boundaries as to the kind - and level - of expectations that shape our social identities. If we accept that the female intellect differs from the male intellect, then we may be tempted

²⁶ Why I am here using Shildricks reading of Foucault, is because she is concerned with Bioethics from a feminist perspective and as such pinpoints selected points of his theory to a field of study (biomedicine and its constituting of the body (Shildrick 1997: 10)) that is closely related to my own investigation.

to conclude that women and men *ought to* occupy different roles in society (in order to make the most of their different implied potential). Individual performances are as such determined by gender. Already in 1949, Simone de Beauvoir pointed to the arbitrariness by which anatomical differences in male and female organisms legitimated a certain societal arrangement, where the woman's situation is ultimately to be the (passive) body and perennial Other to the man (Beauvoir 1965,1: 197). It is hard not to hear the echo in the claim that women are best suited for occupying themselves with tasks that require empathy while the men can go on to build up (and tear down) the world around us.

The work division sustained in the brain-sex discourse should be obvious by now, but 'sex as signifier' implies a whole lot more. Normative ideals as to how we are to conduct ourselves, are saturated with an unspoken imperative of heterosexuality in the performance of human desire. In the following I will look into how - and the ways in which - sexuality is discursively conjoined with anatomical difference.

The Matrix

In the first volume of Foucault's *The History of Sexuality* (1976)²⁷, Foucault investigates the "[...] way in which sex is "put into discourse"" (Foucault 1998: 11). He traces modern conceptions of sex to major changes within Western societies, that demanded a discourse on sex that derived not only from morality - religious at its core - but from rationality as well (Foucault 1998: 24). The simultaneous and gradual emergence of the modern state, characterized by processes of individualization and democratization, made more subtle forms of regulation and control essential to secure the interests of the state, and gave rise to new technologies of power that could enable the management and administration of the population (Foucault 1998: 25): "[...] new methods of power whose operation is not ensured by right but by technique, not by law but by normalization, not by punishment but by control, methods that are employed on all these levels and in forms that go beyond the state and its apparatus" (Foucault 1998: 89). These forms of power techniques originate in the old Christian institutions (pastoral power) but are refined and translated in modern societies (Foucault 1982: 782f). 'Salvation' takes on a more worldly meaning in referring to health, welfare, and security. Knowing the human and its consciousness is also to be able to direct it, and in this sense power is individualizing, yet also totalizing as it concerns whole populations.

²⁷ Titled *The Will to Knowledge*, a redeployment of Nietzsche's notion 'the will to power' pointing to its heritage from Nietzsche's writings and the genealogical approach to 'truth', but even more to the notion of Power and Knowledge as inseparable terms in such analysis. The will to knowledge is what serves as both the support for formulated truths about sex and as their instrument (Foucault 1998: 12).

“This form of power applies itself to immediate everyday life which categorizes the individual, marks him by his own individuality, attaches him to his own identity, imposes a law of truth on him which he must recognize and which others have to recognize in him. It is a form of power which makes individuals subjects” (Foucault 1982: 781).

In the Foucauldian perspective, ‘subject’ has two meanings, neither of them related to ‘substance’ in a metaphysical sense. They are linked with subjugation at different levels, the external level in being *“subject to someone else by control and dependence”* and the internal level of being *“tied to his own identity by a conscience or self-knowledge”* (Foucault 1982: 781). In a discourse where sex precedes gender, i.e. a regime of knowledge where the reproductive organs one is born with determine emotions and behaviour, identity can be said to originate in a pre-cultural sphere. To be sexed then, this particular ‘truth of sex’ functions as the formative principle of identity, in which a salient coherence between sex, gender and desire is required for both cultural recognition and self interpretation (Butler 2007: 130).

The naturalistic account of the body is an essentializing one and it assumes that desire reflects gender that reflects sex. Heterosexual desire is thus naturalized and justified within discourse and this is done by the insertion of the binary categories as fundamental and causal explanations for sexuality/desire (Butler 2007: 31f). In his genealogy of sexuality in a Western context, Foucault demonstrates how it was really the incentive to name and classify sexualities - as a means to control, regulate and encourage a normal reproductive heterosexuality within the confinement of juridical marriage and to pathologize and sanction any deviance from that norm - that brought about the systems of categorisation of sexuality. For instance, the classification of ‘the homosexual’ as a specific type of personality equipped with a homosexual essence (Stormhøj 2003:123). A classic and powerful example of the power of discourse to produce that which it names.

“Foucault argued that “a biopolitics of the population” emerged during the early nineteenth century as pioneer social scientists began to develop the survey and statistical methods needed to supervise and manage births and mortality, life expectancy and longevity. Foucault gave “discipline” a double meaning. On the one hand, it implied a form of control or punishment; on the other, it referred to an academic body of knowledge – the discipline of history and biology. The disciplinary knowledge developed in the fields of embryology, endocrinology, surgery, psychology, and biochemistry has encouraged physicians to attempt to control the very gender of the body by making categories – little cubbies we can put people in based on, for example, their patterns of sexual expression. If the groupings are stable and easily measured, then various medical and psychological disciplines can study them” (Fausto-Sterling 2012: 70ff).

Heterosexuality in a naturalistic discourse is not merely describing a certain sexual preference. The term itself implies ‘sexuality’ as a constant internal part of a person’s identity detached from context. Desire, then, is limited from the start, because to desire something or someone that does not fit the criteria for one’s sexual category will be a contradiction and

thus threaten to undermine the very sense of self-identity. The cultural demand for recognizability is not just something for a subject to measure herself against or negotiate, it works from inside the subject in her own understanding of herself and regulates her thoughts and actions (that regulate the thoughts and actions of others). In other words: individuality is not a given. Individuality takes form according to very specific patterns, that we might (as Foucault and Butler do) call a matrix (Foucault 1982: 783, Butler 2007: 47). The individual incorporation and exercise of societal norms is what Foucault would refer to as biopower and Butler terms *performativity*. This theory is essentially about what 'identity' can be said to consist in, and subsequently about possibility for agency. These notions are of great importance to a critical interrogation of the brainsex discourse, and in the following I will elaborate on the theory for the purpose of returning to the points later within the analysis.

Norms are Violence - Binaries Kill

"Recognition is not conferred on a subject, but forms that subject" (Butler 2007: 18).

The structures that enable and restrict life within culture are also what makes subjects. A subject is only a subject insofar as it has been produced as such and subsequently suited for representation, that is, *subjected to* the requirements of juridical systems of power. The juridical power is the negative, no-saying power that regulates political life through limitation, prohibition, regulation, and control (Butler 2007: 3). The construction of the subject is political, but the processes of subjectivation - the very political operations - are concealed in the analysis of the subject - or any political analysis - that takes these juridical structures as its natural and unquestionable foundation (Ibid). What we are left with is an idea of the structures as necessary and unchangeable ground terms for existence, instead of seeing them as power-knowledge relations that - at least theoretically - can be challenged.

[...] to say that there cannot be a society without power relations is not to say either that those which are established are necessary or, in any case, that power constitutes a fatality at the heart of societies, such that it cannot be undermined" (Foucault 1982: 791).

Power in the Foucauldian sense cannot be disentangled from 'freedom', as it is a ground term for power in its productive mode. The (heterosexual) matrix is constituted by hegemonic discourses and as such it is a word for the discursive field of possibilities within which different types of conduct may be actualized (Foucault 1982: 790). The possibilities for action that individuals and groups are faced with is hence limited. No one can escape the power structures (there is no 'outside' from where we can speak) and subjectivation is not a

matter of pure free will, but Foucault calls for a form of subjectivity that occurs through rejection of the specific forms of individuality that historically have been forced upon us (Foucault 1982: 785); a redeployment of power in Butler's terms (Butler 2007: 169).

In this power-charged field of possibilities, gender is both cultural adjustment and volition. Performativity refers to the ways in which we act in accordance with the matrix, and hence describes the more or less unconscious processes of normalization that form us, direct our conducts, have us direct the conduct of others, and bind us to what is hegemonically considered to be within the boundaries of normality. Language is, of course, a structure that supports political structures and the categories that are operational and intelligible within them. The notion of speech-acts, where *"language gains the power to create "the socially real" through the locutionary acts of speaking subjects"* (Butler 2007: 156) is central to her theory. Repeated acts over time, such as naming, coagulate and produce reality-effects leading to a mistaken belief in their 'facticity' and the natural division - by which sexual categories are presented - is created through the institutionalization of collectively repeated practices (Butler 2007: 157).

"The naming of sex is an act of domination and compulsion, an institutionalized performative that both creates and legislates social reality by requiring the discursive/perpetual construction of bodies in accord with principles of sexual difference" (Butler²⁸ 2007: 157).

It is a major task within feminism to drain categories of their seeming stability and necessity. The signifying economy that relies on difference in a system of binaries and dichotomies is masculinist in its inherent hierarchy that appears as universal rationality; a *"dialectical appropriation and suppression of the Other"* (Butler 2007: 19). Obviously the category 'Woman' does not describe women in all of the diversity found among people that have a bodily part in it. In the lived experiences of real women it is impossible to separate gender from other cultural variables as it intersects with other discursively constituted identities such as ethnicity, class, race, ability, sexuality and regionality (Butler 2007: 4). According to the theory of performativity, gender is an activity and identity is thus an active way of situating oneself in and through accepted norms, *"sculpting the original body into a cultural form"* (Butler 1985: 507). Naturalized assumptions about what is real (i.e 'natural'), like empathizing women, structurizing men, heterosexuality etc., have an inbuilt downgrading of

²⁸ This chapter of Gender Trouble (pp: 151-175) is discussing the writings of Marxist feminist Monique Wittig with whom Butler shares this conviction, but differs from on other perspectives, such as the emancipatory potential of lesbian women (as they escape the compulsory categories of man and woman), that Butler finds to be too heavily dependant on the category of Lesbian (and hence heterosexuality as what is excluded), one that she suspects could turn out just as coerced as the former because of its equally exclusionary properties (Butler 2007: 174).

'natural's opposite'; the 'unnatural'. Representations of identities/expressions that do not conform to the rules of normativity mark them as exceptions to the rule, confirmations of the legitimate hegemony of the rule. 'Sissies' and 'tomboys', homosexual desire incapable of procreative sex. The list is a long one. One might claim that in today's modern societies, homosexuality is a lot more mainstream and accepted than earlier, just as the egalitarian view of men and women seems to be broadly supported. Explicitly anyway. And of course discourses and behaviors develop over time. Binaries are challenged all the time and it does seem to have discursive effects, small disturbances in the force. However, the work towards making more lives possible is a never-ending process. So, homosexuality is no longer on the list of mental illnesses and gay marriage is legalized in more and more countries, but what do the statistics on hate-crime look like? How are trans identifying people treated in the health-'care' system? What is the discourse on sexual fetishes? Go google - and keep asking questions of this kind. It is not pretty. When norms are too rigid, real people are hurt.

"... because certain kinds of "gender identities" fail to conform to those norms of cultural intelligibility, they appear only as developmental failures or logical impossibilities from within that domain" (Butler 2007: 24).

When science keeps looking for explanations for the way we are organized as people by searching for and testing difference, the assumed differences that precedes such investigations are sustained. The male brain/female brain theory divides the human race into two oppositional modes of existing, and in doing so, denies possibilities for life. It establishes difference, but not enough difference. Feminism must insist on diversity but not fall into the relativist mantra of all different = all the same. Foucault speaks of 'dividing practices' as a part of the discursive objectivation of the subject who is consequently *"either divided inside himself or divided from others"* (Foucault 1982: 788). The struggles against this form of subjectivation are anarchistic, Foucault writes, because they are transversal as they are not confined to particular political or economic governments. They are immediate struggles because they evolve around the instances of power that are closest to the people objecting to them, as they are the ones that are restricted and produced by them, but also because they do not point out a 'chief enemy'. They are refusals of certain privileges of knowledge, so rather than a personified enemy, they aim at the techniques of power that are at work in the normative truth laws about 'who we are'. And more specifically:

"They are struggles which question the status of the individual: on the one hand, they assert the right to be different, and they underline everything which makes individuals truly individual. On the other hand, they attack everything which separates the individual, breaks his links with others, splits up

community life, forces the individual back on himself, and ties him to his own identity in a constraining way" (Foucault 1982: 781).

I particularly like this quote as it also stresses community as crucial for emancipation²⁹. Recognition and support from others is an important part of sense of identity and facilitates critical development. Performativity is integral to the matrix, and works as normalization that produces individual agency and performance in a predictable (and thus manageable) way. It is a system of constantly circulated power-knowledge relations that are sustained and reproduced through repetition. Truths are only truths insofar as they are broadly perceived and acted upon as such. It demands individual support on a large scale. I can not position myself outside discourse as I am myself produced and restricted by it, even at my most radical rejection of its premises. The power at work can not be rejected, but Butler suggests that it can be redeployed and subsequently transform discourse from the inside (Butler 2007: 169). Repetition is never an exact copy of what is being repeated and the individual performances that are to some extent determined by the power structures, are also what bear the potential for gradual changes of meaning within discourse. In other words: in order to work against the inertia of the matrix, to dilute essentialist claims about our 'nature(s)' that ignores and conceals its own history, to make way for non conformist gender expressions and sexual preferences, to broaden the scope for future generations possibilities for identification and recognition, feminist communities must work together across as broad a spectrum as possible and make the claims heard. Feminism is about emancipation, not as in a core struggle for women to achieve the same privileges as men, but as a way to denaturalise and contest the hierarchies installed in prevailing systems of power, knowledge and language. The subject of feminism, now, is not 'woman', but precisely to deny it a subject ready for representation in a political discourse, and instead calling into question the mechanisms that produce subjects (Butler 2007: 7f).

A Matter of Construct?

The idea of subject detached from the history of subjectification has deep roots in philosophy. It is present in language and makes essentialism intelligible. In the brainsex discourse the female and male brain determines postnatal experiences of the world. As I initially stated, the aim for a feminist counter-discourse is not to reduce everything to

²⁹ My reading. Foucault does not speak of emancipation in this context. In *Gender trouble*, Butler distinguishes between the 'official' Foucault whom she reads as an anti-emancipatory theoretician and the Foucault that, according to Butler, indulges in an emancipatory discourse in his analysis of Herculine Barbin; a nineteenth century intersex person (Herculine Barbin, dite Alexina B. présenté par Michel Foucault (1978)) (Butler 2007: 131).

constructions and power relations. The deconstruction of sex is not an effort to negate materiality, but to underscore that material facts are given meaning only in - and through - discourse.

*“[...] it is not the task of a deconstructionist critique to **falsify** rival claims³⁰. [...] What the feminist poststructuralist aims to do is to contest the adequacy of all dominant discourses by interrogating and problematising the grounds for their authority”* (Shildrick 1997: 118).

Is it possible to carry out a nonessential but fully material account of the body?

In *Bodies that Matter* (1993) Butler investigates the blurry lines between matter and construct. And while insisting on a body's materiality - and that this materiality has demonstrable effects on the performance of gender - she, at the same time, points to the notion of construction as something that can have real effects insofar it has the *“[...] character of being that ‘without which’ we could not think at all”* (Butler 1993: xi). Sex is physiologically based and gender is constructed. Sexual difference is also constructed:

“Sexual difference [...] is never simply a function of material differences which are not in some way both marked and formed by discursive practices. Further, to claim that sexual differences are indissociable from discursive demarcations is not the same as claiming that discourse causes sexual difference” (Butler 1993:1).

Sex functions as a norm in society, a regulatory ideal in the Foucauldian terminology. Norms only persist insofar as they are constantly repeated and reproduced. This reiteration, Butler claims, is what causes norms to materialize over time - as effects of discourse. At the same time, it is also what exposes materialization as something that is never completed and thus cannot be completely fixed (Butler 1993: 2). For this reason, it is necessary to abandon the sex/gender distinction³¹ that ultimately rests on the assumption, that biological production can be separated from that of the discursively produced within a frame of thought, where sex represents matter and gender represents culture and discourse (Stormhøj 2003: 125). Since we have no access to a pre-discursive materiality of the body, the distinction simply cannot be possible (Ibid). Because gender is produced within hegemonic discourse, this dynamic materialization is simultaneously subjectivation (Stormhøj 2003: 127).

Materiality then loses its ontological status as 'being' because it refers to a process - an effect of power - and *“the materiality of the body will not be thinkable apart from the materialization of that regulatory norm”* (Butler 1993: 2). Thus sex/gender acts as one of the norms that constitutes the subject and governs what is granted cultural intelligibility, and

³⁰ Shildrick quoting the insight of Gayatri C. Spivak.

³¹ Originally marking a milestone within feminist theory as it paved the way for speaking of the socially constructed gender as an analytical category, for the purpose of contesting biological determinism (Stormhøj 2003: 124).

certainly, what is *not*. The latter is an important point, because for Butler, it is within the domain of what discourse cannot name, that the limits of construction are exposed. So, sex/gender is an exclusionary norm, that is entirely dependant on what is 'outside' of it because this 'constitutive outside'³² points to the border between the intelligible, the abject, and the unthinkable and it informs us about what a recognizable (liveable) subject is *not*. In the required processes of identification (becoming a subject), the constitutive outside functions as a threat to the very being of the subject, as categories that are effectively produced and foreclosed by discourse. And so, what is recognized as 'human' is intimately bound to what is 'outside human'. Butler insists that the possibility of disruption and the rearticulation of what can be thought as 'inside' and 'outside' lies in the persistent exposure of these discursive boundaries:

"It will be a matter of tracing the ways in which identification is implicated in what it excludes, and to follow the lines of that implication for a map of future community that it might yield" (Butler 1993: 119).

As much as I appreciate Butlers enormous effort to define a site for subversive agency, it does not exactly yield a guideline for how to move beyond the critical interrogation which I understand as the deconstruction. Butler is clear about the importance of resistance to formulations on behalf of the potential *future community*, simply because their struggles and expressions cannot - and should not - be anticipated and defined in advance (Butler 1993: 227f). However, in the investigation into 'what is excluded from identification', it does seem, that what starts with the problematization of the binary system of categorization, has led us to the refusal of any readymade and suitable subject for representation which consequently leads to an unlimited multiplication of gendered identities (Butler 2007: 173)³³. The latter implication follows logically from experience of a lived reality in which no identity (since it is performative and not fixed in time or space) can be said to be identical with another. And as such categories are merely expressions within a patriarchal language structure, incapable of encapsulating the human being in its diversity.

The Art of Knowing

So, modern power is productive of truths and transformative of meanings, working at a material level as much as a discursive. The potential for disruptions and discursive

³² A term that Butler takes over from Jacques Derrida (Stormhøj 2003: 122).

³³ *"Because [the] process [to become a women] is in no way fixed, it is possible to become a being whom neither **man** nor **woman** truly describes. This is not the figure of the androgyne nor some hypothetical "third gender", nor is it a transcendence of the binary. Instead, it is the internal subversion in which the binary is both presupposed and proliferated to the point where it no longer makes sense"* (Butler 2007: 173).

expansions is thus a potential for materiality to unfold within a different frame for comprehension. Shildrick calls it a 'slippage' between what is possible for the body and what is required by it (Shildrick 1997: 58). Following what has here been extracted from the work of Foucault and Butler, knowledge of the body is not something that actually allows generalization, but must be in intimate relation to the individual body.

Objectivity in any traditional sense is thus utopian and a harmful ideal to maintain, unless the utopian property is an integral and visible part of the term. But how then, can we know anything? How can we even have meaningful conversation? And how can feminism contribute to the ethics of science without causing total paralysis? I find the following quote from Donna Haraway to be spot on in expressing the dangers of lingering within the frames of deconstruction:

"I, and others, started out wanting a strong tool for deconstructing the truth claims of hostile science by showing the radical historical specificity, and so contestability, of every layer of the onion of scientific and technological constructions, and we end up with a kind of epistemological electroshock therapy, which far from ushering into the high stakes tables of game of contesting public truths, lay us out on the table with self-induced multiple personality disorder" (Haraway 1988: 578).

That is why it may be the time to bring theory down to earth a bit. If we are to initiate an opening for reflection on how to see, speak and account for the world in a more responsible (ethical) way, it helps to visualize alternatives to the doomed-in-advance dichotomy of radical constructivism, where the world is reduced to powermoves and games of rhetoric, and scientific empiricism. Haraway's *Situated Knowledges* (1988) suggests an approach to the production of knowledge, that I think will be helpful for a form of feminist activism that retain the constructivist objections to truth without denying reality and agency. Vision is its focal point:

"All western cultural narratives about objectivity are allegories of the ideologies governing the relations of what we call mind and body, distance and responsibility. Feminist objectivity is about limited location and situated knowledge, not about transcendence and splitting the subject and object. it allows us to become answerable for what we learn how to see" (Haraway 1988: 583).

Haraway insists on objectivity as a possibility but in a form that is miles away from the idea of 'true universal knowledge' and hence the term takes on a completely transformed meaning in her writing. She works with much the same kind of subject as Foucault and Butler, one that cannot (and should not) escape the ways in which it has been constituted. Vision is naturally embodied and any representation of disembodied vision is thus a concealing of the knower; *seeing everywhere from nowhere*, what Haraway calls "*the god trick*" (Haraway 1988: 581). This gaze, she writes, signifies the unmarked positions of Man and White (coupled with Butler, we can add 'heterosexual') who naturally get to perform

representation of all while escaping representation himself (Ibid). Positivist sciences are god tricks and so is relativism, which she calls the *“perfect mirror twin of totalization in the ideologies objectivity [...] both make it impossible to see well”* (Haraway 1988: 584). Feminist objectivity consist in a reclaiming of the gaze. Thus ‘feminist objectivity’, in Haraway’s theory, simply means; situated knowledges (Haraway 1988: 581). It is not an ‘all different = all equal-doctrine’ because there can be no privileged insider vision. Instead what is called for, are webs of connections and communities dedicated to learning from a multitude of views while resisting romanticizing any of them, as no subject position is ‘innocent’ no matter what privileges - or lack of - can be ascribed to it (Haraway 1988: 584). Local and partial knowledge has to be partially translated among very different communities with critical awareness of the equally different power moves at work. ‘Seeing from below’ in science is to seek the subject position, not of identity, but as partial connection and affinity by choice. The scientific knower is held accountable for what she knows about ‘the real world’ (positioned rationality (Haraway 1988: 590)) and the knowledge partially shared from one limited location to the other; a power charged social relation of ‘conversation’ (Haraway 1988: 593).

“The split and contradictory self is the one who can interrogate positionings and be accountable, the one who can construct and join rational conversations and fantastic imaginings that change history” (Haraway 1988: 586).

Subjectivity is multidimensional and holds no ground for ontology. Thus splitting - not being - grounds feminist epistemologies of knowledge (Haraway 1988: 586). The prediction of rational knowledge developing from shared and discussed accounts of what can count as such does not foreclose what cannot be anticipated in advance. It will be a constant process of exchange and translation motivated by - and sustaining - the possibility of political solidarity (Haraway 1988: 584). This claim is highly ideological and ought to be considered - and spoken of - as such. In a neoliberal political landscape, it is always tempting to shape your argumentation rhetorically into a form that is hegemonically accepted to avoid controversies for the sake of reaching the goal. However, the means to an end and the desired outcome in these instances are two sides of the same coin. Solidaric exchange of limited knowledge produces a notion of knowledge that radically departs from the term as it has traditionally been conceived of in Western culture and philosophy. It basically means giving up privileges that centuries of colonialist knowledge production has brought about, as a logical consequence of taking responsibility for ‘how we learn to see’. Situated knowledges, I think, bear resemblance to what Deboleena Roy calls ‘shared perplexity’, and it is indeed about feminist ethics in science. It urges the seeker of knowledge to consult with a multitude of (limited) voices in order to account for the world in a way that does not lose

sight of the contradictory paradoxical complexity in the human ability to see and reason. "Only the god trick is forbidden" (Haraway 1988: 589).

Scream!

Feminist accounts of 'the real' are tied to specific experiences within patriarchal structures and of the symbolic violence inflicted by being put in place as Other. Shared perplexity means openness to - and solidarity with - voices of the otherwise unheard, the gazes from the subjugated. Feminist ethics in science must take steps towards a levelling of privileges and this involves a critical questioning of the material-semiotic effects in people's lived realities. In other words, who is structuring the narratives of difference?, who remains silent?, who benefits from certain accounts and who does not? In a radical egalitarianist view, the aim of ethics is to level out welfare so that everyone has equal part in the total amount of welfare³⁴. Now, there are a great amount of complications built into such theory (that I will not address), but to claim equality as an ideal and something worth striving for, does seem to prescribe a form of 'compensation' for subject positions that are the destined losers within the heterosexual matrix, whom Butler referred to as the *developmental failures* or *logical impossibilities* within that domain. It is a rather delicate balance to acknowledge and realize the contextual differences between feminist struggles, and to know when to speak and when to back down in order not to derive other positions of the opportunity to speak for themselves. To create public space for discursively silenced voices is not simply a matter of 'giving' or 'allowing' minority voices (whatever issues these positions may concern themselves with) the space, as this - once again - foregrounds the more privileged. In other words; The act of upgrading insider perspectives for the sake of demonstrating unbiased mentality and open mindedness, benefit the 'upgrader' more than the 'upgraded'³⁵. Challenging hegemony obviously does not translate into thankfully accepting the positions given to you by dominant culture. I will return to the notion of solidaric exchange of situated knowledge, and elaborate on what it means in practice, as I apply it to feminism in science.

³⁴ Stanford Encyclopedia of Philosophy (Stanford)

³⁵ I want to draw a parallel to the notion of 'The Native Informant' heavily problematized within the field of postcolonial studies. Gayatri C. Spivak's merciless deconstruction of post-development theories points to the problematics involved in well-meaning attempts not to speak for the subaltern by pointing out a 'subaltern representative' who then does the speaking instead. As a result, she claims, the knower - now positioned *behind* his object of knowledge- is effectively concealed along with the political process of producing a suitable representative, allowing the knower to wash his hands, so to speak, and evade his own involvement in the oppression of the Other and, at the same time, ascribe the responsibility for change exclusively to the subalterns. Moreover, glorification of the 'insider position' is dangerously present, what enables essentialization and romanticizing of 'native identity' and once again Western hegemony is consolidated (Kapoor 2004: 630f).

Recapitulation

By assembling a selection of feminist theoretical points for further analysis, I have now positioned myself and put forward a theory that aims to place emphasis on (feminist) ethics in the production of scientific knowledge. The feminist project, as I subscribe to it, seeks emancipation via levelling of privileges. This task does not imply a revolution, rather it would seem that all we can hope for in terms of transforming discourse are disruptions, re-articulations, and redeployment of power in and through performative acts of iteration. In regards to science more specifically, Thomas Kuhn wrote that: *"Its [a new theory] assimilation requires the reconstruction of prior theory and re-evaluation of prior fact, an intrinsically revolutionary process that is seldom completed a single man and never overnight"* (Kuhn 1996: 7). In relation to the brainsex claims, feminism is well employed on a number of matters. First of all, the notion of objectivity has to be addressed and rethought for a use that does not assume that we can obtain absolute true knowledge about the material world, because knowledge of an object and the materiality of an object is a symbiotic relation: both truth and instrumental to the production of truth. We need non-essential yet fully materialistic accounts of bodies before we can even begin to speak about any such thing as differences between men and women. This process begins with a genealogy and deconstruction of the very categories of sex that reveals their inadequacy in naming the phenomena they are installed to represent. This is not (and ought not be) a sign of linguistic monism, but a pointing to a reality in which differences are multiplied and where any use of representation has to rest on a committed attention to the intersections of gender, sexuality, raciality, class, ability, ethnicity, and regionality that cannot be disentangled from each other for the sake of simplistic division. There **are** material differences between different brains and bodies that are important to investigate, but neglecting to see them as produced and evolved within a context, is to foreclose possibilities for a future in which difference does not necessarily entail naturalized hierarchy³⁶. To deny the sexed subject its substantive appearance is not to do away with the subject: It is a way to query its terms of existence and to seek to avoid self fulfilling prophecies that uphold and defend stereotypical representation of any section of the population. Neuroscience is still at its infancy and not

³⁶ Christine Delphy brilliantly captures the arbitrariness of hierarchised difference in her vegetable analogy by which she states that; *"[W]e may agree things are only known by distinction and hence by differentiations, but these differentiations can be, and often are, multiple. Alongside cabbages and carrots, which are not 'opposites' of each other, there are courgettes, melons, and potatoes. Moreover, distinctions are not necessarily hierarchical: vegetables are not placed on a scale of value"* (Delphy 1993: 4).

(yet at least) capable of translating structural differences into functional differences. As a field of science it enjoys great popularity and authority, but ‘with great power comes great responsibility’. We need questions of shared perplexity for an ethical response to essentializing claims. A constant and solidaric exchange of limited gazes might broaden the scope for what can be culturally recognized and may enable a developed sense of diversity in which what is considered ‘normal’ will just be what is ‘usual’ and where ‘unusual’ does not mean ‘wrong’.

Part III

Analysis: Feminist Epistemology in Neuroscience

“In order to shift the politics of the body , one must change the politics of science itself”
(Fausto-sterling 2000: 8).

In the following, I will dig deeper into the topic of brainsex by elaborating on both claims in support of the brainsex theory and the criticisms that contest it while I apply the feminist theory as presented above and discuss the implications of sex/gender normalization and subjectivation in different contexts. By joining Fine’s critique with the feminist project it is my aim to incorporate historical conceptions and the discursive powers at work in the neuroscientific distinctions between men and women. This task involves an inquiry into the relations between pleasures, power and knowledge that produce and discipline us as sexed subjects, in neuroscience and elsewhere. The question of which norms persist silently within neuroscientific methodology will help shed light on the political motivation for the differentiation and underline the constitutive force of language in the organization of social life. In this process, the question of the desirability of maintaining a two-sex system emerges along with the discussion of the prospects for a greater degree of social equality through the gradual dismantling of the seemingly fixity of gendered categories. I ask how natural science and feminism can benefit from each other in the strive for new conceptualizations of human differences that do not rest on binary, stereotypical representations of ‘who we are’ in order to both take the actual biological diversity into account and to expand the discourse on sex/gender in a manner that allows materiality to unfold in new ways. Through this part of the thesis I have chosen to focus on some of the most compelling arguments in favor of ontological distinction between men and women and put the claims into perspective by addressing question in relation to work division, family life and the medical management of

individuals that biologically fail to meet the standards for genital normalcy. By doing so, I hope to render visible the ways in which normative ideals for gendered identity works as omnipresent regulations, withholding us from equality, understood as ethical mutuality.

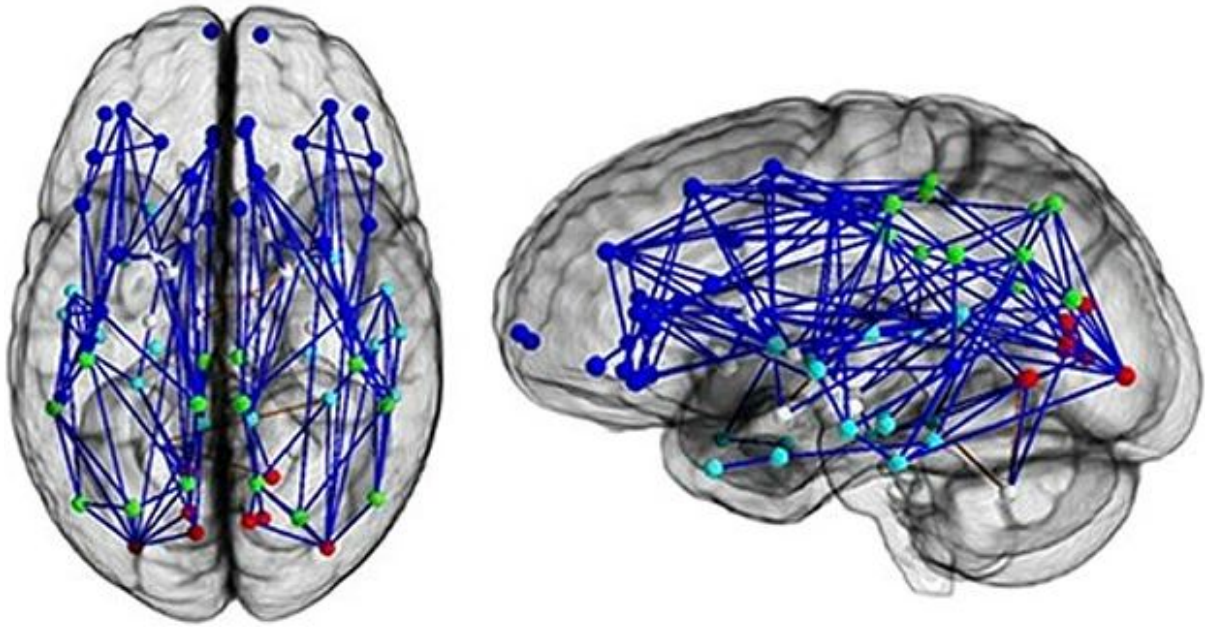
It all starts in the womb:

About six weeks after having been conceived, the male foetus starts developing testes while the female foetus develops ovaries. Two weeks later, the testes of the male foetus start producing large amounts of testosterone. The testosterone surge in utero is essential for the development of male genitalia (Fine 2012: 100f). The theory stating that testosterone organises the male brain differently from that of the female dates back to the 1980's when behavioral neurologist Norman Geschwind suggested that foetal testosterone slows the growth of the male brain's left hemisphere and that this leaves men with a "*superior right brain hemisphere talents, such as artistic, musical, or mathematical talent*" (Fine 2012: 104).

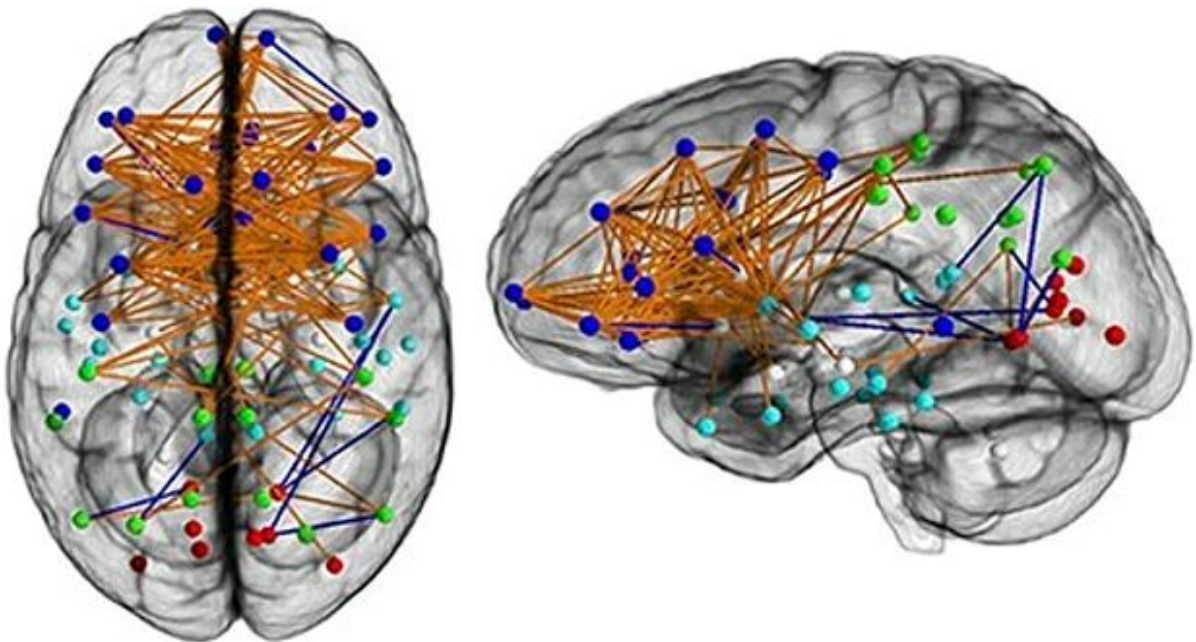
"This led to the idea, that male brains are more lateralised (or specialised) than female brains, on average. That is, males tend to stick to their shrivelled left hemisphere when grunting monosyllables and use the roomier right hemisphere when processing visuospatial stimuli. By contrast, women's brains are supposedly less lateralised: during both language and visuospatial tasks, women tend to use both sides of the brain" (Fine 2012: 136).

Today this claim is supported by research based on the use of MRI scans that allow a look into the living human brain³⁷. The images below show how the processing of information supposedly goes on in female and male brains respectively, starting with the so-called male brain:

³⁷ The technicalities involved in collecting data on brain activity by the use of MRI scans are much more complicated than these simple words suggest. A more detailed explanation will follow in a later chapter.



And the 'female brain':



I retrieved these images from an internet article from The Guardian (The Guardian 2013) in which a study conducted by a Regina Verma, researcher at the University of Pennsylvania is presented as research that “confirm what many had surely concluded long ago: that stark

differences exist in the wiring of male and female brains" (The Guardian 2013). The article quotes Dr. Verma:

"If you look at functional studies, the left of the brain is more for logical thinking, the right of the brain is for more intuitive thinking. So if there's a task that involves doing both of those things, it would seem that women are hardwired to do those better," Verma said. "Women are better at intuitive thinking. Women are better at remembering things. When you talk, women are more emotionally involved – they will listen more."

[And she adds:] "I was surprised that it matched a lot of the stereotypes that we think we have in our heads. If I wanted to go to a chef or a hairstylist, they are mainly men" (The Guardian 2013).

The co-author of the studies; neuroscientist Ruben Gur³⁸ is also quoted in the article:

"It's quite striking how complementary the brains of women and men really are," [...] "Detailed connectome maps of the brain will not only help us better understand the differences between how men and women think [...], but it will also give us more insight into the roots of neurological disorders, which are often sex-related" (The Guardian 2013).

The (disputed) left-right hemisphere hypothesis states that the thicker corpus callosum in women makes a speedy interhemispheric transmission of information possible and that women process emotions better and faster than men (Fine 2012: 149).

There are a lot of technicalities to be addressed here, but for starters, what is offered as explanation for the sex differentiation seems to have everything to do with prenatal testosterone/androgens i.e. the levels of hormones that the baby is exposed to prior to the event of being born. However, the differences in neural activity appearing to *cause* differences between men's and women's ability and way of processing information are developed much later; it is interesting that the differences in question are not notably present in early childhood. The article briefly mentions this developmental aspect by stating that; *"[M]ale and female brains showed few differences in connectivity up to the age of 13, but became more differentiated in 14- to 17-year-olds"* (The Guardian 2013), but does not comment on it any further. In summary the article - though unambiguously promoting hardwired difference as factual knowledge - states that before puberty, boys and girls process information similarly (with internal differences, but not based on gender). Then, and with puberty setting in in the early teens, the differences start being visible on the MRI. In other words, when sex starts to matter, it *materializes* in the brain-structure.

It would be too easy to claim that the symbiotic relation between matter and construct, as presented by Butler, can be applied uncritically to this plasticity of the brain. Perhaps future research will show that brain development in some unknown way guides the gender of the body it inhabits, one that cannot currently be traced on an MRI. It has been suggested, that

³⁸ Ruben Gur is a long time defender of the brainsex hypothesis.

“early hormones set all manner of processes into motion that could converge on behavioral differences days, weeks, months, or years down the road” (Moore³⁹ in Fine 2012: 104). What we do know, however, is that environment has a notably impact on the shaping of brains (forging of neurons). Due to this knowledge, the standard argument that relies on the causal relation between hormones, brain, and (gendered) identity can just as easily be turned around. Not to say that there is a direct chain of causality going in the opposite direction, but simply to state that the argumentation cannot be valid. One must be cautious with explanations by which the motivation and the conclusion both serve and constitute each other, what seem to be the case for the hormone-brain-identity-nexus.

Sex, when seen as a regulatory norm that sets the boundaries for intelligible conceptions of the body, functions as the law that governs what can be thought and said about sex, which will have material effects on sex. In this view it is not too far fetched to suggest, that the norms that precede the subject and forms that subject, also take part in shaping it quite literally - or materially to use a more accurate term. So when women tend to use both sides of the hemisphere when processing information, is that because of a universal biological design that ensures the survival of the species by the having two types of a token: a caretaker and a breadwinner joined in life-giving heterosexual desire? Or could it be, that the biological body, sexed from the beginning, responds to, and abides by the cultural laws that demands such division and unity? Does one necessarily rule out the other?

It should now be clear, that speaking of brains, bodies, sex and preferences as internally connected is no simple task. To perform a simplistic turning-around-the-argument maneuver and thus rendering the brainsex theory useless by positioning ourselves solely within a philosophical framework seems just as reductive. We need to incorporate data and research from the fields of natural sciences that does not have the preferred (normative) outcome as its simultaneous motivation. In *Sexing the Body* (2000) biologist Anne Fausto-Sterling explains the process of brain development and the aforementioned plasticity as an activity that goes on continuously throughout the entire lifespan. The incomplete brain of a newborn has tentative connections between nerve cells and other parts of the body that requires some external stimulation in order to become permanent. Throughout the first twelve years

³⁹ Celia Moore: developmental psychobiologist at the University of Massachusetts; author of *Maternal contributions to mammalian reproductive development and the divergence of males and females* (1995). Her studies centres on the question of *how* early hormones affect behaviour in postnatal life. She has conducted experiments on rats, showing that neonatal testosterone in this particular species is merely one of several factors to consider, and that for instance maternal treatment has great influence on the pup's brain formation (Fine 2012: 105).

of life, unused neural connections disintegrate (Fausto-Sterling 2000: 240). So what is present (or potentially present) from the beginning does not persist if no use is made of it. Neural connections turn solid in a process where the brain produces a fat-containing sheath around the individual brain fibers. The sheath is called myelin and much of the process of myelination that structures brains (differently) take place within the first ten years of life, but this does not result in a completed and fixed brain (Ibid). As the article says, a great deal of myelination occurs between the age of ten and twenty (Ibid), but another significant amount occurs between the age of forty and sixty; *“making plausible the idea that the body can incorporate gender-related experiences throughout life”* (Fausto-Sterling 200: 240). Indeed, any type of repeated experience can alter our physiology. Fausto-Sterling takes up examples of *cortical reorganization*; a term employed for describing the process in which the outer layer of a part of the brain (cerebral cortex) that is connected to a certain body part becomes visibly larger in persons using the body part in question at an unusual high frequency. Research on the digits of string-players and on people that at an early age turned blind and have become skilled braille readers show, that the representation on the cerebral cortex of the digits employed for these activities have enlarged (Fausto-Sterling 2000: 240f). And this is within the span of one lifetime. In short we can say, that frequency of specialised activity matters for our physical development. Just like hard physical labour will result in increased muscle formation, our brains change form due to specialization. The more you perform a certain task, the better your brain will work in favor of performing the task well, be it high level mathematics or language. The answer to questions about *who* can become a specialist - an effort that no doubt will benefit enormously from regular, uninterrupted training and peace to work, all factors that are incommensurable with housework, childcare and a hostile work-environment - is culturally conditioned.

Size Matters

The impulse to pin psychological differences on observed hormonal differences (or any other sex-differences in the brain) has some intuitive appeal. But because there are measurable brain differences, it does not necessarily mean that they cause different behaviour. In fact, the very opposite possibility is one that needs consideration and has been employed in studies of brain size. The fact that men's bodies are typically larger than women's is also reflected in brain size. On average, although there is as overlap, men's brains tend to be bigger than women's brains (Fine 2012: 143). I have not encountered any material that suggests otherwise. Brain size matters in many aspects. Fine argues that differently sized brains actually have physical reasons for different arrangement (Fine 2012: 143). Larger

brains, she writes: “[...] create different sorts of engineering problems [...] to minimise energy demands, wiring costs and communication time [...]” (Fine 2012: 143). Or we can say that different sized neural machinery will confront similar cognitive challenges differently: “*The brain can get to the same outcome in more than one way*” (Fine 2012: 143).

How the different components of the brain are connected and what behavioral ends these structures entail, need to be investigated from a multitude of angles and through the posing of many questions of difference. As for any science or general idea of development, a lot of ‘what we know’ is most likely to become ‘what we thought we knew’ in the future. In earlier research, for instance, grey matter (the spongy, folded grey-ish tissue that makes up the cortex and can basically be described as that which divides the different regions of the brain) was thought to bear the most significance for the properties of the brain, while white matter was not given much attention. White matter is basically the network for transportation of information between the brain regions. Metaphorically it can be referred to as ‘the subway of the brain’ (Biomedcentral 2014)⁴⁰. The information transmission work very fast due to the aforementioned myelin insulation, that encases every single neuron’s process transmitting signals to other neurons. Malfunctions in white matter has long been acknowledged as having slowing effects on the internal communication between brain regions, but more recently, research has showed that a whole range of cognitive deficits are associated with ‘white matter diseases’⁴¹ that each has different impairing effects on different abilities such as memory, visuo-spatial construction, and language (Biomedcentral 2014). Now, we recall that the latter two abilities were associated with the male brain and the female brain respectively, which is why I am giving attention to this research in the context. The maleness-femaleness continuum finds it logic in measurable sex differences, but the differences found can be tied to other, non-gender related variables, such as size and age.

Up until recently, it has been considered a scientific truth, that on average, men have larger proportions of grey matter relative to women while women on average have larger proportions of white matter relative to men - though in both cases with overlaps. However, more recent studies suggests that when measured up against body size and amounts of grey matter *relative to brain volume* i.e. the density of brain-fibers, it shows that rather than *women* sharing this trait of the brain, it is actually people with smaller brains who share

⁴⁰ As done by the author of the article: James Balm.

⁴¹ When small blood vessels inside white matter in the brain hardens and block the way for nutrients so they have a hard time reaching the cells in white matter, and thus interfering negatively with “the subway system” of the brain (Biomedcentral 2014).

qualities that differs from those people that have bigger brains (Fine 2012: 143). In other words; this difference does not actually seem to correlate with sex difference⁴².

“If this principle proves to be correct - there’s currently no agreed way of controlling for absolute brain size - then, unless we’re happy to start comparing the spatial or empathising skills of big-headed men and women with those of their pin-headed counterparts, we may have to abandon the idea that we will find the answers to psychological gender differences in grey matter, white matter, corpus callosum size or any other alleged sex difference in brain structure that turns out to have more to do with size than sex” (Fine 2012: 143).

Being male or female does not naturally decide the size of your brain and it does not cause certain proportions of white or grey matter. Research such as this done on white matter disease, points to a reality in which our cognitive abilities are not dependant on our gendered dispositions but a whole range of factors, including the effects of external stimulus.

Compensatory Differences

A substantial part of the theories on human brains and behaviour, has arisen from studies on animals. For obvious reasons, conducting experiments on living beings that have no status of autonomy in a world ruled by human reason, is made a lot easier because it passes as ethically sound. Although conclusions drawn from research on animals cannot be directly applied on humans, they can be used as suggestive ideas for explanations. What is interesting about mammals - since we belong to the same category - in behavioral research, is that they seem free of the capability of reflecting about their specific place in the world. Heterosexual matrix or not, they do what they do and for that reason, looking for consistent patterns of sex-typed behaviour bears a promise of coming to some conclusions about correlations between sex and behaviour. Animals adapt to their environment in various ways, and sometimes they surprise us with ‘clever’ arrangements that could not be anticipated by sex-difference alone.

Both Fine and Fausto-Sterling introduce several animal studies in their work, which serve to shed light on biological differences, sameness, and variability in the material world. The theory of ‘compensatory differences’ is one of those critical and somewhat counterintuitive responses to the hegemonic assumption of causality between brain structure and behaviour, and one that has been derived from animal testing. Neuroendocrinologist⁴³ Geert de Vries

⁴² I return to the topic of distribution of white matter, grey matter, and other neural connections later on when presenting and discussing state of the art research that confidently supports what Fine is here suggesting more cautiously.

⁴³ Studies the impact of hormones on the brain.

uses studies on paternal behaviour in prairie voles⁴⁴ to exemplify how differently structured brains can yield similarity in behaviour (Fine 2012: 142). Apparently male and female prairie voles take equal part in the caring for their pups (apart from providing the breast milk of course), but while this behaviour in the female is triggered by hormonal change due to pregnancy, this is not the case for the male. Triggering of paternal behaviour is associated with the lateral septum, a part of the brain that shows striking sex-differences (very different distributions of hormonal receptors), but in the case of the prairie vole, these differences in brain structure brings out behavioural similarity (Fine 2015: 142f), and as such the sex-difference - instead of *causing* different characteristics in males and females - seems to be doing the opposite, namely *preventing* sex differences in behaviour (Ibid). Observations like these are interesting yet disturbing for our need for continuity and simple explanations, but it is necessary to assess all possibilities and by doing so, risk the 'failure' to come to unequivocal conclusions about the properties and function of the brain. Giving up the claim to 'true knowledge' also means embracing the contradictions we encounter in the real world and refraining from this all-too-human desire to make unified and systematic sense of the world. It is important for a more nuanced view of materiality, that we do not sweep exceptions to the norm of the table, but consider their implications carefully. "*Exceptions are not there to "prove the rule". They have meaning in and of themselves*" (McClintock quoted in Roy 2012: 225).

More answers might be forthcoming from neuroscientific research as technology and frames for understanding progress, but at this stage of development, the risks involved in "*premature speculation*" (Fine 2012: 131) are indeed too grave for a notion of ethics that take the question of equality as a goal. The responsible knower is careful to the awareness of the potential weaknesses of her/his/their methodological approach - a point that leads me to one of the most prominent processes involved in the collection of data on the living human brain.

MRI - Vision and Knowledge?

As we know, a lot of the research supporting the claim to brainsex are done with the aid of the MRI scanner. In popular culture, this work-tool is often portrayed as technological machinery so advanced that it is capable of something very similar to actual 'mind-reading'. Images of living brains shows neural activity within different regions of the brain that are associated with different functions/behaviours, and the researcher can collect data and look for correlations between activity in the different brain regions and functions. First of all, it

⁴⁴ A small social hamster-like rodent.

should be firmly stated - once again - that correlation is not the same as causality. Remember how HIV and AIDS were at first considered to be the 'gay-man-virus'? Even when we know for a fact that this is not the case, the stigma has survived the brutal gang of facts even within the health'care' system. For instance, homosexual men are still not allowed to donate their blood in Denmark anno 2016 though as far as I know, analsex is not preserved for the male gay community (again anal sex does not *cause* HIV, but in comparison with the the vaginal wall, the wall of the rectum is slightly thinner and thus at a slightly bigger risk for breakage during penetration, creating a slightly bigger risk of the virus entering the bloodstream). It is important to take up examples such as this, because it shows how an obvious falsity becomes a meme within a discourse that protects certain ideals. Second, and here it gets a little complicated; “[...] *the patches of colour you see on a brain scan don't actually show brain activity*” (Fine 2012: 134). I will leave the detailed explanation to Fine:

“fMRI doesn't measure neuronal activity directly. Instead, it uses a proxy: changes in blood oxygen levels. (PET⁴⁵ uses radioactive tracer isotope, which attaches itself to glucose or water molecules, to indirectly track blood flow.) Busier neurons need more oxygen and (after an initial dip) active brain regions have higher levels of oxygenated blood, because blood flow to that area increases. The oxygen is carried by the haemoglobin in red blood cells, and haemoglobin has slightly different magnetic qualities depending on how much oxygen it's carrying. This creates a signal in the scanner (which pulses a magnetic field on and off). Neuroscientists then compare the difference in blood flow in brain regions during the task they're interested in, with blood flow during a control task or rest state. (Ideally, the control task involves everything the experimental task entails - button pressing, word reading and so on - except for the psychological process you're particularly interested in.) Researchers test for significant differences in blood flow in various locations of the brain regions during the two tasks, and if tests indicate that is is significant, a blob of colour is placed at the appropriate location on the picture of the brain” (Fine 2012: 134f).

So the colours we see on brain pictures from the scan represent *statistical significance*, but not before the end of a process that contains several stages of complicated analysis (Ibid), and in a context that is partly conditioned by the aforementioned 'file-drawer phenomenon' coupled with the financial aspect that often results in small samples rather than large. As a consequence the risk of misinterpretation of the collected data is conspicuously present for this kind of research.

This technique of studying the brain, inevitably positions the researcher at an *“interpretive remove”* (Fausto-Sterling 2000: 126). According to Butler; what can be interpreted, is made possible, rationalized and defended only to the extent that the operationalization of the language structure and discourse permits it. As such, well-established categories and thus difference between them, run the risk of going unnoticed and unproblematized. The idea that

⁴⁵ Positron emission tomography.

you can watch how your brain works on a screen, endows the research with tremendous authority. But this use of language simplifies the vast complexity that underlies it. Moreover, assuming that sex/gender represents the main difference in brain-structure seems better explained by the history of the idea of dimorphic sex (that sex is divisible into two categories), than it does as physiological facts.

To repeat: the dichotomy that places 'woman' as the passive opposition to the active 'man' is biologically conditioned but its implications in terms of hierarchy and division of work are socially constructed. Sex materializes in - and through - gender roles constituted by traditional notions of what counts as feminine and masculine behaviour. The performative characteristics of gender makes it an activity and the process of identification involves individual participation in - and negotiation with - gendered positions. What counts as feminine or masculine behaviour is historically constituted and enjoys high authority, but as terms they are dynamic and active, not fixed. However when speaking of sexuality and the norms that govern this part of human existence, heterosexual desire is the unquestioned natural activity that everything else is measured up against.

Preferences

What is perceived as 'natural' include orientation and preferences towards pre-gendered objects, those made (discursively) available to different gendered positions. Or less technically: a 'natural ('real') woman' also naturally identifies herself with 'feminine virtues', find joy in 'feminine activities', refrains from those that are located within a 'male domain' (not so much because she is denied access as because of her non-interest and non-self-identification with this domain), she sexually desires a man and the end goal of her desire is motherhood in a monogamous relationship. This stereotype, as we saw in Fine's discussion, is effective in keeping women from male domains in their professional life. When coupled with Foucault's theory on subjectivation it is clear, that power at work is also highly productive as real people are 'happily' participating in the reproduction of sextyped behaviour by demonstrating certain sextyped preferences. In the light of the research and theory presented, it is not controversial to claim, that for example, the 'cross-talk' between the two hemispheres that female brains tend to perform, could stem from socially tuning to the female positions made available by discourse. If I experience coherence between my biological sex and my preferences and thus identify with 'woman' as a socio-political category, I am also to a large extent a product of my experience as performing 'woman'. Does it not make sense then, to view the activity and properties of my brain as at least partly

shaped by the cultural expectations of 'woman' - or female-typed behaviour? We might be compelled, to ask yet again; *"Where else but in the brain would we see the effects of socialisation or experience? - How else would socially constructed differences manifest themselves?"* (Fine 2012: 170).

In an earlier chapter, I briefly mentioned studies on CAH girls (the condition stemming from the female foetus being exposed to unusual high levels of testosterone in utero) to point to the methodological difficulties with disentangling prenatal hormonal influences from post-birth experiences of identification with prescribed social roles. What was tested was the children's preferences for toys, based on the idea that CAH girls might be more likely to be systemizers rather than empathizers and therefore show more interest in boy-ish activities and toys⁴⁶ (Fine 2012: 120ff). Their toy-preferences do differ from non-CAH girls, and those differences also seem to continue into adolescence. This could be a clear case of hormonally induced sex-difference as the study suggests (Fine 2012: 122). It is clear that hormones do indeed affect the formation of the brain, but several studies investigating this question combined, still do not form any basis for a generalisation of just how it brings about sextyped behavior. Perhaps because social/cultural factors cannot and should not be excluded from the equation. *"Is it possible that what researchers is seeing in girls with CAH is greater identification with male activities, whatever they might be?"* (Fine 2012: 122). The question proposed here, suggest that the girls in question, growing up in a society that demands identification with gendered norms, do not find traditional girl-sh activities and toys as appealing and thus do not identify with 'girl', turn to the only other possibility for identification available in the two-sex system; that of 'boy'. There is certainly a difference between the assumptions in which A; a toy possesses boy-ish qualities in itself or B; a toy is culturally associated with boys. The point being, that presupposed difference shapes the method of obtaining data and play a role in what kind of difference is brought forth and what is concluded. A singular view on what might establish *the* difference is inevitably blind to the potential for a variability of difference that might otherwise occur. Roy's neuroethical questions find their utmost importance here. Are we trying to understand difference, or are we establishing difference for the sake of difference itself? (Roy 2012: 220).

⁴⁶ Girl-ish activities/toys include dressing up as a fairy, -a witch, -a woman, ballet, gymnastics, playing hairdresser and working with clay. Boy-ish activities/toys include dressing up as an alien, -a cowboy, -a man, -a pirate, playing spaceman, basketball. Neutral activities often include a puzzle and a sketchpad (Fine 2012: 122).

The question of preferences and where these 'emerge' from seem to be crucial for the debate. So far, the points I have extracted and joined, point to a theory in which cultural restrictions enhance differences between sexes by making it difficult to supersede the cultural boundaries for gendered behaviour. To give an ultra-short recap of the gathered theory and empirical studies: Sexual preference is restricted, professional preference is restricted, identity preference expressions are restricted, and all from the very beginning. The materiality of the body cannot be separated from the discursive production of culturally recognizable bodies which makes the *relation* between what the body is capable of (biologically) and what is required by it (socially) that which constitutes sex/gender.

Sex and gender are two sides of the same coin, matter and construction, impossible to separate and isolate because we cannot think one without the other⁴⁷(Butler 1993: xi). Butler stresses the importance of looking to possibilities for eruptions and displacements of naturalized norms within the domain of 'the abject', somehow located along those discursive boundaries that mark the limits of thought. It thus seem potentially productive to pose questions on the topic on how non-conforming and underprivileged gendered expressions can challenge natural sciences and to what degree they hold the potential for informing the norm of its own flaws and impossibilities and by doing so, pave the way for a scientific adoption of shared perplexity.

Categorized Mom (and Dad)

However, instead of moving straight into an inquiry on lived experiences of people who are in obvious conflict with norms favoring (white) monogamous heterosexual men/women (in that hierarchical order), I would like to briefly consider an aspect of the category of 'woman' where, it seems to me, biology find its strongest argument for natural legitimacy in structuring the social world. The female reproductive anatomy and bodily function in terms of maternity does indeed mark the notion of sex/gender difference as biologically installed. It is an undeniable fact that most women are naturally equipped with a set of reproductive organs that makes her the child bearer in the matter of reproduction. Now, coupled with the claim, that women are natural empathizers, gifted with patience and communication skills that exceed that of an average man, it would almost seem like a no-brainer (no pun intended) to state that women as natural caregivers make not only "*the most wonderful counsellors primary-school teachers, nurses, carers, therapists, social workers, mediators, group facilitators or personnel staff*" (Baron-Cohen (2003) quoted in Fine 2012: xix), but also the

⁴⁷ For that reason it does not make much sense to separate them into two concepts, unless it is the contestation of (any of) them that is the aim.

best and most naturally prepared *parent*, at least when this term refers to being attentive of the child's needs for nurture. Thus the bodily function of women 'naturally' leaps into social functions and a division of work that from this perspective, is not oppressive or sexist, but natural and right. As such, I think it will be fruitful to call into question the processes of subjectivation that constitutes and produces 'mother', or in other words: maternal subjectivity.

The status of women as childbearers constitutes gender difference culturally, politically, and juridically. Another undisputed (biological) fact, is that the survival of the species calls for babymaking. Every species has a way of nurturing its infants and in the case of humans, the ways in which this task can be done, and done well, are obviously multiple. The nuclear family structure is prevalent, but historically its monopoly is decreasing, not least due to new generations of individualists and the concomitant high divorce rates and processes of self-actualization but also because parenting as a stable concept is challenged and changing by ever emerging alternatives (Fraser 1994: 592). It is of course true, that in order to create a human baby an egg and a sperm cell is needed. But it is no longer true, that heterosexual desire is necessarily involved in this process. Technology supersedes the boundaries of nature every day and has historically made life possible in ways that go far beyond any notion of 'natural causes'. Nor is it impossible to fulfil the basic requirements for responsible parenting in other settings than that of the mom-and-dad-together-for-better-and-worse. Post-industrial families are less conventional and more diverse (Fraser 1994: 592). As such, we ought to consider any standpoint on family structure that takes the nuclear family as its singular ideal for the upbringing of new members of society as its logical foundation, to ultimately be an expression rooted in a deeply conservative worldview. We should at the very least recognize such claims as inherently political, that is, employed as means of bringing forth a politically motivated effect in society. Neurosexism though, as Fine is warning us, seems capable of erasing the notion of an underpinning political project. This is, in Haraway's words, a forbidden 'god trick'. I think that directing a critical look at mothering as an activity deeply embedded within the category of 'woman', but at the same time as precisely that: an *activity*, not separated from the rules of performativity, will prove useful for a further analysis of how to bring questions of shared perplexity into science and into our most private spheres. The second wave feminist slogan 'the personal is political' prevails.

The argument that "*women choose the social roles that best fit their female mind*" (Fine 2012: 26) puts an element of volition into an equation that otherwise looks suspiciously like

determinism. The only way to make sense of it is by accepting a premise in which any woman is to some degree free to choose the social roles that she takes on, but that she should not expect neither fulfilment nor social acceptance by deviating from the path of femininity and furthermore, that the social sanctions she will inevitably confront are normal and self-inflicted (you just had to go and make things difficult on yourself, didn't you?!). However, following Fine and Butler (each with their own background and vocabulary), the 'female mind' is removed from the individual brainsphere and translated into those conventions and social expectations that precede and form the subject born with a female reproductive anatomy. Whether we talk in terms of implicit mind, stereotype threat, performativity, or processes of subjectivation, we can conclude, that 1): Our minds are not transparent to ourselves and 2): No subject is its own point of departure.

The matrix does not offer unlimited positions to occupy and performativity does not imply a choosing subject that can wear and change identities like picking an outfit depending on mood and circumstances. Agency within the theory of performativity is limited by the constraints of discourse. The subject as we recall, is paradoxically both constituted through its submission to power and as the possibility for resistance to it (Stormhøj 2003: 126).

The social role of 'mother' is particularly governed as any concept of 'good parenting' involves sufficient nurture, self-sacrifice, cognitive -and affective empathy, and stability in regards to providing for (at the very least) the child's basic needs. Dividing people into two separate but complementary categories; the caretaker and the breadwinner joined in heterosexual alliance does hold some appeal: mothers give birth, breastfeed and thus - rule the domestic sphere, while dad - as he is naturally precluded from the bodily experience of childbirth - brings home the bacon. But there are some very interesting observations and studies regarding contemporary Western nuclear-family households and their 'adaption' to the reality in which mom has joined the labour force, as has been increasingly common over the past fifty years.

All Equal but Some More Equal Than Others

"Behind every great academic man there is a woman, but behind every great academic woman is an unpeeled potato and a child who needs some attention" (Fine 2012: 93).

The traditional marriage contract creates separate spheres for men and women, his public, hers private (Fine 2012: 79). To some of us, it may seem like a completely outdated narrative, but women's work is still valued less than a man's and as we have seen, stereotypes at work do not create an encouraging environment for female high achievers.

First there is the ‘motherhood penalty’; an expression coined to explain disadvantages that mother’s are facing within the labour market. Legal advisor and sociologist Tamar Kricheli-Katz writes on the subject:

“Mothers are disadvantaged in the labor force. In the U.S., they face a wage penalty of approximately five percent per child and discrimination in hiring and promotion. Several studies have shown that cultural expectations of the “good mother” are antithetical to expectations of the “ideal worker”. Good mothers are expected to be devoted primarily to their dependent children. Ideal workers, however, are expected to be available and committed primarily to their work and are therefore assumed to have no care responsibilities. This contradiction causes mothers to be evaluated as less productive and less competent workers and, therefore, to be discriminated against in the allocation of jobs, wages and promotions” (Kricheli-Katz 2012: 557).

If the stereotype that governs and directs women that can add ‘mother’ to their personal profile prescribes the role as the main caretaker - making sure that both her offspring and her (male) spouse have their domestic needs covered - what happens when she is also working a full time job and perhaps even making more money than her partner? Introducing research done within the field of sociology⁴⁸, Fine examines division of work in contemporary Western nuclear families in which both parents, or solely the women, hold jobs. Somewhat paradoxically, the pattern that emerges from these studies reveal the seemingly ‘unconventional’ marriage (where *she* is the primary breadwinner) as terribly conventional when it comes to domestic chores. Women generally perform the vast majority of domestic labour and childcare, even when they work longer hours and pull a higher wage than their male spouses (Fine 2012: 80), a phenomenon popularly termed ‘the second shift’. Author of the bestseller *Men are from Mars, Women are from Venus* (1993)⁴⁹ - and prominent defender of the brainsex theory - John Gray explains this extra workload on women as a part of her cerebral biology that causes her brain to produce oxytocin⁵⁰ when performing routine housework and nurturing tasks. As such, he describes those chores as *rewarding*, though only to the female mind (Fine 2012: 81f). Others, including Michael Gurian⁵¹, suggests that

⁴⁸ Arlie Hochschild’s book *The Second Shift: Working Parents and the Revolution at home* (1990), Sampson Lee Blair, and Veronica Tichenor figure as sources in this chapter of *Delusions of Gender* under the headline ‘Gender equality begins (or ends) at home’ (Fine 2012: 78-96)

⁴⁹ This book is estimated to have been sold in more than 50 million copies worldwide and it spent 121 weeks on the US bestseller list, making it part of cultural lore. I have chosen to include his rather outrageous (blatantly neurosexist) line of argumentation here, merely for the reason that Gray enjoys a huge audience and as such; high authority on the matter.

⁵⁰ A mammalian hormone associated with social interactions and bonding (Fine 2012: 81).

⁵¹ Co-founder of the Gurian Institute that provides training for teachers in gender differences and learning, based on the idea that boys and girls, due to their innate, hardwired differences benefit from single sex education (Fine 2012 : xvii, 139f). One of the offered training sessions: *Boys and Girls Learn Differently* (Gurianinstitute) is based on the claim that: “[...] *the very nature of a child—including the gender—requires us to look at boys and girls differently at home as well as in the classroom. Absolutely equal—but different*” (Gurianinstitute). This approach to differentiated learning techniques pose questions like: “*How can you get him to stop tapping his fingers or pencil on the desk or jiggling*

the female brain is simply 'better' structured to detect and put order to a disorganized home environment (Fine 2012: 82) on top of its higher capacity for empathy. Sociologists offers another view on this phenomenon and refers to it as 'gender deviance neutralization'⁵² (Fine 2012: 82), a praxis where "[S]pouses work together to counteract the discomfort created when a woman breaks the traditional marital contract by taking on the primary breadwinning role" (Fine 2012: 82). Cultural expectations of mothering behaviour place actual mothers in weak positions for negotiating how to divide domestic chores. By adding *biological necessity* to their natural nurturing skills, it fundamentally supports a structure in which men and women are believed - and encouraged - to contribute with substantially different qualities in private as well as in public. The *discomfort* that nontraditional gender roles generate, stems from them being perceived as dissident which leads, in turn, to judgement and suspicion. In the public sphere, women are held socially accountable for the degree to which they live up to their responsibility as mother and wife to a far greater degree than men are held accountable for being father and husband. In my own observation, striking examples of such structural difference show every time a parliamentary election is held: Female candidates are asked questions about how they balance family and career (read: are you also a 'good mother' or are we to label you *competent but cold*?) while male candidates can talk about the line of politics they represent. Both the breadwinner and the caregiver are necessary components of a functional family, but it is nowhere written in stone that this involves two different personalities or even two (different) people, though somehow it seems to translate that way in the brainsex discourse, where male brains and female brains are described (or is it prescribed?) as complementary. When the male part of a parental partnership is justified in investing his attention in "*rather detailed scrutiny of narrowly characterised processes*" (neuroscientists Rachel and Ruben Gur quoted in Fine 2012: 144), the female (counter)part is left with the grand overview of - and responsibility for - the general well-being of the family; not only a considerable investment of emotional energy, but obviously a time-consuming task as well. Cleaning, cooking, playing, grooming etc. takes up a lot of time! From this perspective, mom is prevented from 'detailed scrutiny' for practical reasons more than anything else, and there is obviously a huge difference between not having the abilities required and not having enough hours in a day.

It follows, that 'mother' marks a stable identity; a culturally recognized and encouraged position for the maternal subject to be defined - and interpret herself by - as a process of

his feet?", and "*How can you get her to stop worrying about impressing the boys and focus on learning math?*" (Gurianinstitute, my emphasis).

⁵² Fine makes use of the insight provided by Michael Bittman and adds that sociologists have not reached full agreement as to how this pattern is best explained (Fine 2012: 257, Note 7).

subjectivation in the Foucauldian sense. The limitations and constraints embedded in the positions available for mothers are connected with those of women in general. And while many individual women happily take on an identity that supposedly makes them *different but equal* to men, the privileges that men enjoy, privately and publicly, continue to form a domain that women are excluded from, by virtue of bodily distinction. Women's inferiority is maintained by the material-discursive realities (including language itself) and determined by patriarchal interests (Shildrick 1997: 117).

Reproductive Sex

Feminist sociologist and social anthropologist Rhonda Shaw draws on Butler for a discussion of acts of mothering and the ethical aspects of the role as caretaker.

The 'naturalness' by which the labour division is presented in the brainsex discourse implies an implicit, unconscious desire to fulfill the role ascribed to one's sex. Such view neglects consideration of the normative rules of motherhood, that the maternal individual is subjected to, and thus her acts of nurture are not recognized as rational - just as her compliance with and/or refusal of the norms do not appear as constant negotiations of her limited position.

Accepting the theory of performativity implies, first of all and in this connection, that 'mother' must be stripped of its substantive appearance in order to perceive acts of nurturing as *ethical* acts rather than as a natural, unquestionable, and immanent part of her being from which the caring relation with her child flows (Shaw 2004: 100). Emily Jeremiah⁵³ conceptualizes this as a linguistic move from 'mother' or 'motherhood' to 'mothering' which underscores its performative qualities (Jeremiah 2006: 21). Shaw claims that the idea of caring activities⁵⁴ as taken for granted, is supported by the assumption, that such acts are motivated by "*a natural pre-disposition that does not presuppose rational self-consciousness*" (Shaw 2004: 100), which excludes embodiment from the purview of ethics (Ibid). Again, this assumption is rooted in a masculinist system of thought, in which rationality and irrationality define each other in and through their dialectic relation.

"[...] it appears to support a cognitivist and universalizable view of morality. In this respect, it valorizes the faculty of reason and relegates emotion and affect to the world of instinct and pre-thought" (Shaw 2004: 100).

⁵³ Dr. Emily Jeremiah, senior lecturer at Royal Holloway University of London.

⁵⁴ The main focus of Shaw's article is the act of breastfeeding, but she maintains, that when this view of childcare as an in-the-body practice is subscribed to, it applies to care in all its forms (Shaw 2004: 100).

Intentions, for them to be morally valid in this traditional sense of disembodied reason, is then purely a result of the rational mind having counterbalanced the possibilities of action in a given situation. Now, mothering is discursively and materially tied to the female body, but where does that leave the father? Surely he does not experience the coming of a child in the same bodily manner, but I think we can assume that childbirths give rise to emotion and affect on both sides of the gender-fence. 'Fathering' acts, of course cannot be broadly considered to be calculative and merely informed by reason. We could object to the whole thing, by claiming that we ought to talk about 'parenting' instead of employing a gendered division that maintains the two-sex system. But that would be to ignore the ways in which 'mother' and 'father' marks two separate positions with very different possibilities - and privileges. Men and women alike might act on the basis of similar emotions and rationales when it comes to parenting, but the privilege of being perceived as a choosing agent - a moral being - and thus the one that deserves gratitude and adulation for acts of compassion and nurture - is assigned to the male. The historical perspective on women's roles and bodies serve as underlying legitimization. Shaw explains:

"Women's association with the activities of the private and domestic sphere has meant that their lives are constituted less by putatively rational or calculative actions and more by affection and emotional relationships with others. This sexual division of labour seems to reinforce the view, that women's lives are very much concerned with things to do with reproduction and preservation; that is, about reproducing the self and others and about reproducing the species. When the activities associated with human reproduction are naturalistically equated with the female body, as they often are, women's bodies and their bodily functions (e.g. menstruation, pregnancy, maternity, lactation), are seen to have little, if anything, to do with reason, choice, and autonomy. [...] What is significant about the (female) reproductive body in this understanding is that inhabiting it, by definition, precludes the possibility of moral identity and behaving ethically" (Shaw 2004: 100).

Combining this view of women's bodies with the division of work stemming naturally from fundamental differences in cognition as shown by Fine in the previous chapter, does not leave mothering much room for agency. The concept of 'maternal instinct' is inherently essentialist and requires of the mother, that she *instinctively* knows the needs of her child (while this burden does not seem to rest that heavily on daddy's shoulders, freeing him to pursue less 'emotionally' invested activities while mom is changing nappies). Jeremiah suggests we consider relations between mother and child as heterogenic by speaking of 'maternal attitudes' rather than 'maternal thinking' as a way to get rid of the idea of instinctive behaviour (Jeremiah 2006: 24). As such, she brings attention to the vast variety of ways of 'doing' mother, though she neglects that the same goes for 'fathering', which I find to be of great importance in a perspective for change, that I will return to later. A dedication to the gathering of situated knowledges and shared perplexity on the subject of maternal attitudes would serve as an instrument for broadening the scope of what can be considered 'good

parenting' and thus create possibilities of identification with the role of mother (as well as that of father, co-parent, single-parent etc.) from non-essentialist accounts of the relational, including that of parent and child.

Only within the masculinist signifying economy of man/woman is the latter reduced to passiveness. 'Mother' should not, as a consequence of being positioned in a realm outside culture, be objectified as silent and powerless. The inferiority that falls on women is intimately linked with the prevailing Cartesian idea of (male) abstract rationality by which a subject is thought to make self-determining decisions in stark contrast to the incompetence associated with its dialectical (female) opposition: emotion, intuition, and irrationality (Shildrick 1997: 120). Michelle Chandler argued that 'mother' is best understood as a verb (Chandler cited in Jeremiah 2006: 25), and in that line of thought, 'motherhood experience' is a (limited) position to speak from rather than an activity to be described. Situated knowledges defy normative description but strengthen and broaden reflection, not least in relation to the question of the various motives for ethical response to the needs of others that obviously escape the label of sheer 'female intuition'.

Mutuality is Ethical

But what does a refusal of the objectification of 'mother' entail for the ethics of childcare? Surely it is highly unethical to refuse the nurturance of helpless infants; even for a self-acknowledged queer-feminist killjoy⁵⁵, emancipation does not reside in the refusal of reproduction or of children's failure to thrive (!). But to rearrange responsibility and establish gender equity does. To view maternity as performative is to place materiality in culture and vice versa -and it displays the interconnection between 'woman' and 'mother' as both biologically and socially conditioned. Jeremiah adapts Butler's notion of the interrelation between matter and construct (as cited in the previous) to maternity:

"To claim that maternal experience is constructed is not the same as claiming that construction causes maternal experience" (Jeremiah 2006: 25).

When the stable 'I' that speak is removed from the equation, it relocates the concept of ethics: *"Selves do not generate ethics; rather ethics produce selves"* (Shaw 2004: 103).

⁵⁵ Meant as a reference to the work of Sara Ahmed and her characterization of the feminist presence perceived as a fun spoiler for everyone else because of the feminist problematization of oppressive structures. In other words; by pointing to the problem, you yourself become the problem and risk the social sanctions of being excluded and/or ridiculed (which are just a few of the ruling techniques that is operationalised when silencing a critical voice) for the sake of internal (and blameless) coherence within groups of shared conformity (Ahmed 2010).

Reaching out to others is at the core of ethical action and the relationality involved in the mothering praxis needs to be viewed as an ethical response - that is not confined to the category of woman. Jeremiah views maternal relationality as caring relations between bodies that take place in corporeality and as such, an ethical ideal that is not fixed (Jeremiah 2006: 27). On the contrary, it is sensitive to context and to the eye of the beholder. I might here state the obvious; that context based ethical treatment of others does indeed involve components of both rational thought, affect and intuition. In fact they simply cannot be separated since an individual's way of seeing and doing things are rooted in her/his/their specific (situated and partial) knowledge, experiences and attachments. Shildrick proposes a *"more fluid mutual responsibility and care as distinguishing factors of human morality"* (Shildrick 1997: 122), which I see as what could be a step towards the ideal of 'parenting' rather than 'mothering' and 'fathering' being actualized. The potential to disrupt the status quo lies in the gradual dismantling of the dichotomous mindset that justifies it. A notion of morality that does not divide reason from emotion, but acknowledges their intertwinement naturally also refuses them as hierarchically placed in relation to each other. Shared perplexity demands genuine mutuality. In a parental relationship this translates to a praxis of shared responsibility, not just employed in everyday childcare, but also towards one another.

Scepticism towards the structurally produced positions available for women-and-men/moms-and-dads respectively does not entail unethical treatment of children or indeed anyone else: it encourages new ways of thinking about - and organising both domestic and public spheres in terms of hierarchy and division of work. The care involved in a rethinking of the values that are historically ascribed to traditional female and male contributions to the parental league is highly ethical. It enables parental subjects to move beyond the restrictions of their sex/gender. Again, norms only persist insofar as they are constantly repeated and reproduced by individuals on a large scale. Theoretically the possibility for norm-transformations consists in gradual and minor disruptions rather than earthquakes. As conceptualised by the derridean notion of *différance*, the meanings of sex/gender is open to challenge and thus alternative practices, including parenting. However, the meaning of 'parenting' will continue to be divisible into two separate and mutually constituting meanings; 'mothering' and 'fathering', as long as the politicised two-sex system prevails in contemporary discourse. Science's commitment to the view that sex is dimorphic rather than continuous and sensitive to context, contributes a great deal to this problem.

As authoritative opinion formers, neuroscientists have responsibilities in regards to a general societal development. With a sharpened look at its own normative assumptions, its use of language, and more attention to contributory cultural factors and ethical issues, neuroscience bears promise of many new discoveries that might enable better theories and understandings of how we function as people, including how gender manifests itself. Importantly, they might enable people to become far more aware of the restrictions embedded in the essentialist notion of sex/gender and in turn encourage to seek the potential for alternative arrangements of their relations whether they are practical, platonic, romantic, parental, professional etc.

How we bring forth difference and the battle within politics of meaning that this implies (Roy 2012: 229), starts with a critical self-examination of the sciences. This is one way to become accountable for how we learn to see and a recognition of ‘vision’ as something that becomes a material discursive practice over time (Barad 2003: 818).

The Mosaic Brain

As this thesis has been under preparation, new research has emerged. In ultimo 2015 neurobiologist Daphna Joel and colleagues presented a study that goes further than the examination of whether or not the existence of sex/gender differences in the human brain is sufficient to conclude that human brains are sexually dimorphic; i.e. divisible into ‘male’ or ‘female’ (in line with what has already been discussed, this study also denies such division). What has been added here, has to do with the demands for such distinction to be acceptable, namely the fulfilment of two conditions:

“[...] one, the form of the elements that show sex/gender differences should be dimorphic, that is, with little overlap between the forms of the elements in males and females.

Two, there should be a high degree of internal consistency in the form of the different elements of a single brain (e.g., all elements have the “male” form)” (PNAS 2015).

It is not enough to show sex/gender differences in specific regions of the brain for the theory to hold. This study is assessing internal consistency in the degree of ‘maleness-femaleness’ of different elements within a single brain, and by doing so, looking at sex differences on the level of the brain as a whole⁵⁶ (PNAS 2015). The empirical data used for the study comes from the analysis of MRIs of 1.400 human brains, and what is revealed besides *“extensive overlap between the distributions of females and males for all gray matter, white matter, and*

⁵⁶ *“The heterogeneity of the human brain and the huge overlap between the forms that brains of males and brains of females can take can be fully appreciated when looking at the entire brain” (PNAS 2015).*

connections assessed” (PNAS 2015), making the first condition unfulfilled, is that internal consistency within a single brain (a female brain in which features of all regions of the brain associated with processing of information and behavior are consistently at the female end of the male-female continuum) is a rarity (PNAS 2015). Most brains show “*substantial variability*” (PNAS 2015), meaning that they in some regions would be at one end of the continuum while other regions would be at the other end. The signs of poor internal consistency, they conclude, is further predicted by evidence (such as presented by Fine and Fausto-Sterling in the previous) “*that the effects of sex may be different and even opposite under different environmental conditions and that these sex-by environment interactions may be different for different brain features*” (PNAS 2015). So to sum up in non scientific language, it can be articulated as following: Different situations and conditions have different effects on different brain regions in different brains. If it sounds like I am not really stating anything useful for classification, it is because I am not.

The researchers found that; “*regardless of sample, type of MRI, and method of analysis, substantial variability is much more prevalent than internal consistency*” (PNAS 2015) and any conceptualization of a simple or causal relation between sex and the brain has to be dismissed for the simple reason that it is unscientific. Joel and her colleagues thus prefer speaking of the brain as *mosaic* (PNAS 2015) as a metaphor that encapsulates that; “*most humans possess a mosaic of personality traits, attitudes, interests, and behaviors, some more common in males compared with females, others more common in females compared with males, and still others common in both females and males*” (PNAS 2015). Roy’s reminder of the importance of making room for - and incorporating - variability on multiple levels of a process in research on difference rings loudly from this study as well. Scientific responsibility (or plainly put: good science) depends on methods of analysis that both take into account the great variability in the brains of humans “*as well as individual differences in the specific composition of the brain mosaic*” (PNAS 2015).

The implications of adopting the mosaic view that human brains are characterised by substantial variability are enormous on both scientific and social levels. As for science, I think that Fausto-Sterling hits the nail on its head when stating: “*I continue to insist that scientists do not simply read nature to find truths to apply in the social world*” (Fausto-Sterling 2000: 115). Chasing stereotypes to make the view of two complementary sexes scientifically (and thus discursively) valid cannot be anything other than politically motivated, and questions as to who benefits from such arrangement of the social world has

to be addressed. For this reason alone, feminism in science is a necessity. Historically feminists have made sex/gender problematics visible, and with the ever increasing attention to intersectionality; the range of cultural variables that constitutes and positions subjects differently, feminism continues to contest commonly held beliefs about 'nature and nurture'. The metaphorical description of the human brain as mosaic, points to the importance of the awareness and attention to intersectionality in research on difference: Finding difference and similarity in individuals is a matter of looking to the details of individual brain mosaic along with the specific function that a specific study takes interest in, because *"it is the specific details of a brain mosaic which determine that brain's function"* (Frontiers 2011). Science, in order to be good science, will have to resist the all too convenient translations from structural difference to functional difference (Roy 2012: 220) along with the assumptions of possibilities for major generalizations.

What needs to be discussed and rethought from the scientific point of view is also current for our social spheres, namely the meaning of sex/gender as a social category and the desirability of maintaining a two-sex system, that not only fails to create a valid basis for explanations of the material world, but upholds and reinforces arbitrary hierarchies that degrade real human lives. The 'true nature' of the form of the human brain is that it is extremely variable. What causes variability are complex interactions of a multitude of physical and social factors present in and around an individual. Genes, chromosomes, hormones and environment all take part in shaping a human - in utero and throughout life - and they are not divisible entities that can be studied in isolation if we want to know how sex/gender manifests itself and/or how to create possibilities for greater equality. It is reasonable to suggest, that the entire medical praxis could change as an effect of adopting a far more fluid view on sex/gender by taking cultural factors as equally important for the process of subjectivation and materialization of our bodies.

"The suggested conceptualization [the mosaic hypothesis], which holds that sex affects the direction of change one's brain may take in response to specific events and therefore the likelihood of such events to lead to specific neuropsychiatric disorders" (Joel and colleagues in Frontiers 2011).

The insight that specific events in an individual's life is powerful enough to bring about changes of personality; for instance depression or posttraumatic stress, is nothing new. Nor that sex/gender as a social category has a lot to do with how we experience our surroundings. Moreover, the scientific acceptance of individual surroundings and experience as factors that partake in the shaping and altering of our minds both physically and mentally

gives rise to ideological scrutiny and the abandonment of the outdated nature vs. nurture discussion, that has dominated the discourse for too long. What makes a man? What makes a woman? Such questions can no longer qualify as scientific since they necessarily call for generalisations that are not scientifically sound to begin with.

It has been shown, that even in the few domains of the brain in which consistent sex differences are found, the measurements of difference are small and mostly with considerable (if not extensive) overlaps. Joel concludes that the brain itself is *intersex*, regardless of bodily distinctions (Frontiers 2011). In other words; genitals do not define your brain. In daily life, however, we do not actually get to peek into each others brains for clues about what and who we are looking at. Most of the time, physically visible signs guide our classifications. The interpellation that takes place when a baby is identified as boy or girl creates a lifelong guiding principle for his/her individuality. Terms like gender dysphoria or gender identity disorder used by physicians and psychologists for individuals that in various ways do not identify with their biological sex category, clearly points to the perception of sex/gender as formative principle of identity, something that should (if healthy/normal) naturally flow from the body itself. But the two-sex system that is insufficient for the classification of the human brain, also falls short when it comes to the human body.

The Object - The Case of Intersex

Human diversity is not covered by the terms man and woman; historically, socially, culturally -and biologically. Brains are plastic and obviously bodies, including genitalia, differ in size, shape, features and capacities. Some bodies when coming into the world do not fall into either category, because genitalia come in variations that exceed the classifications available.

The topic of intersex has been researched and explored for decades. More recently, however, the framing of the topic has undergone some positive changes, not least due to an increasing demand from intersex people for being heard on their own terms and from their own perspective (Greenberg, Herald & Strasser 2010, Fausto-Sterling 2000: 84). These voices are already changing the way that medical science has traditionally discussed and treated cases of intersex and the potential for these knowledges to trickle-down into society and become popular knowledge, could be highly valuable for the struggle to open up the discourse on sex/gender and a general contestation of the binary system for categorization. But as demonstrated in the following, the institutions lacking behind on the development, need further education.

Intersex persons embody ‘both sexes’ quite literally (Fausto-Sterling 2000: 8) as the term refers to individuals born with varying mixes of anatomical components conventionally attributed to both male and females (Fausto-Sterling 2000: 31). In Joel’s definition of the intersex brain, the variability leaps out:

“Intersex refers to individuals for whom the match between the different levels of biological sex (genetic, gonadal, hormonal, and genital) is not perfect (e.g., a person with male chromosomes (XY), male gonads (testes), and female external genitalia, as in complete androgen insensitivity syndrome), or the form of one or more sex characteristics is intermediate between the male and female forms (e.g., ambiguous genitalia)” (Frontiers 2011).

Historically intersex persons have been figuring in myths, laws and literature since ancient times, though different societies have viewed them with different sets of social and juridical norms and sanctions (Fausto-Sterling 2000: 35, 40)⁵⁷. Along with the emergence of nineteenth century medical sciences and knowledge as means for population-control (disciplining techniques of power) as described by Foucault, came also *“the authority to declare that certain bodies were abnormal and in need of correction”* (Fausto-Sterling 2000: 36), and the medical practice became the faculty from where the status of intersexuals were decided. Up until today the idea of ‘correcting nature’s mistake’ has prevailed as the chief ideology that guides the decision-making on the matter of intersexuality. In other words; physiological diversity is being erased and forcibly made to fit the two-sex system.

“From the viewpoint of medical practitioners, progress in the handling of intersexuality involves maintaining the normal. Accordingly there ought to be only two boxes: male and female. The knowledge developed by the medical disciplines empowers doctors to maintain the mythology of the normal by changing the intersexual body to fit, as nearly as possible, into one or the other cubbyhole” (Fausto-Sterling 2000: 8).

In early 2013, The United Nations (UN) released a report⁵⁸ in which normalizing-surgery on infant intersex babies were condemned and health-care providers were collectively addressed and urged to *“be cognizant of, and adapt to, the specific needs of lesbian, gay,*

⁵⁷ Historically also commonly referred to as ‘hermaphrodites’ (from Greek; a mix of the masculine Hermes (son of Zeus) and the feminine Aphrodite (goddess of beauty and sexual love)), a term now broadly considered to be derogatory, though I have encountered a few instances of a reclaiming of the term. One instance found is the journal *Hermaphrodites with Attitude* (published 1994-2003(Isna-1)) often associated with Cheryl Chase; Intersex activist and founder of Intersex Society of North America (ISNA) ISNA is self reported to be *“[...] devoted to systemic change to end shame, secrecy, and unwanted genital surgeries for people born with an anatomy that someone decided is not standard for male or female”* (Isna-2).

⁵⁸ The Special Rapporteur on Torture and other cruel, inhuman or degrading treatment or punishment; Juan E. Méndez, to the United Nation’s Human Rights Council (UN 2013).

bisexual, transgender and intersex persons” (UN 2013: 8). In conclusion, on the matter of genital-normalizing surgery, it is firmly stated that:

“The Special Rapporteur calls upon all States to repeal any law allowing intrusive and irreversible treatments, including forced genital-normalizing surgery, involuntary sterilization, unethical experimentation, medical display, “reparative therapies” or “conversion therapies”, when enforced or administered without the free and informed consent of the person concerned. He also calls upon them to outlaw forced or coerced sterilization in all circumstances and provide special protection to individuals belonging to marginalized groups” (UN 2013: 23).

Sadly only seven out of the twenty-eight countries that share the membership in the EU have updated their medical practises accordingly. Denmark belongs to the category of nations that despite these explicit warnings, retains the harmful practice of correctional surgery. In a current instruction from one of the major Danish hospitals (Skejby Sygehus) it is *“advised that genital-normalizing surgery is performed on children before the age of 15-18 months, based on the opinion, that it would be “unthinkable” that a Danish child will be able to develop psychologically without having unambiguous external genitalia”* (Information 2015, my translation).

I will return to the problematics of these medical procedures, but first I will spend some words on clarifying the concept of intersex. The term serves as a superordinate for many variations of non-binary genitalia or rather non-dimorphic sexual development (Fausto-Sterling 2000: 53), stretching from visibly atypical from birth to very subtle forms of sex variations, some of them not detected before puberty, if at all. Intersex has recently - in 2006 - been renamed as ‘disorder of sex development’ (DSD)⁵⁹, which have given rise to hot disputes within intersex movements. Sociologist, intersex activist, and author of *Contesting Intersex -The Dubious Diagnosis* (2015); Georgiann Davis discusses this linguistic (power)move and claims that:

“[B]y renaming intersex—and specifically by calling it DSD—providers used the power embedded within diagnostic terminology to linguistically reinvent intersex, and thus to thwart our public criticism of their harmful practices. Medical providers no longer fix intersex—they treat disorders of sex development” (Davis in Fromthesquare 2015).

While there can be strategic reasons for embracing a term that invariably pathologizes the body, I follow Davis in her analysis in which the power embedded in medical terminology,

⁵⁹ “[...] when a “Consensus Statement on Management of Intersex Disorders” renamed intersex “disorders of sex development,” or DSD for short. The statement was published in *Pediatrics*, the official journal of the American Academy of Pediatrics, and today DSD terminology has replaced intersex language in virtually all corners of the medical profession” (Davis in Fromthesquare 2015).

once again is being used against the people it was meant to represent and thus I refuse this medical term⁶⁰.

The frequency of the birth of intersex babies and a total number of intersexuals (both those who have and have not undergone correctional surgery) is thus difficult to say with certainty. The Intersex Society of North America (ISNA) list a range of medical conditions and their estimated frequency (table below) that shows the complexity of this term. The numbers are drawn from an article by Fausto-Sterling⁶¹.

Cause	Estimated frequency
Not XX and not XY	one in 1,666 births
Klinefelter (XXY)	one in 1,000 births
Androgen insensitivity syndrome	one in 13,000 births
Partial androgen insensitivity syndrome	one in 130,000 births
Classical congenital adrenal hyperplasia	one in 13,000 births
Late onset adrenal hyperplasia	one in 66 individuals
Vaginal agenesis	one in 6,000 births
Ovotestes	one in 83,000 births
Idiopathic (no discernable medical cause)	one in 110,000 births
Iatrogenic (caused by medical treatment, for instance progestin administered to pregnant mother)	no estimate
5 alpha reductase deficiency	no estimate
Mixed gonadal dysgenesis	no estimate
Complete gonadal dysgenesis	one in 150,000 births
Hypospadias (urethral opening in perineum or along penile shaft)	one in 2,000 births
Hypospadias (urethral opening between corona and tip of glans penis)	one in 770 births
Total number of people whose bodies differ from standard male or female	one in 100 births

⁶⁰ Bacchi's WPR-analysis (What's the Problem Represented to be?) is useful for the critical inquiry into the underlying meanings and desired outcome that are invisible but structuring of the certain ways in which a problem is framed within policies (Bacchi 2010). Following her approach, the categorisation of intersex as a disorder simultaneously points to the intersex-condition as the problem (that needs solving), instead of pointing to problematics in the way that society (and medical practitioners) view the condition.

⁶¹ Fausto-Sterling, Hull (2003)

Total number of people receiving surgery to “normalize” genital appearance one or two in 1,000 births (Isna-3)

As it shows, the spectrum between ‘absolute male’ and ‘absolute female’ (whatever the extent of such terms may be, who can tell?) has many biological positions in between them. Nature itself makes possible body-formations that is unthinkable within discourses of the heterosexual matrix. It is paradoxical, that a system of thought that is heavily reliant on biological foundations for the explanation of its (hierarchical) order, finds itself ‘incapable’ of incorporating factual biological diversity. But for it to do so, would be to shake its very foundation, namely the clear division of sex into two stable entities. If a nature based taxonomy system is incapable of accounting for nature as it manifests itself before us, could it be that the system needs changing? Epistemological breaks are obviously a part of the history of knowledge. Change is evident, but we are responsible for the kind of change we enable.

Man and woman as complementaries that together fully represents ‘human being’ is an effect of discourse. They are, as Wittig wrote; *[...] political categories, not natural facts*” (Wittig quoted in Butler 1985: 511). The discursive limits that constitute the boundary between the intelligible and the abject - the site for potential disruptions that Butler suggests - is not then, at least in this case, an abstract rhetorical ‘invention’ (cf. common critiques of social constructivism) - but indeed very material.

Is it ethically sound though, to insist on biological diversity, on behalf of little children, that are likely to grow up in realisation of their their status as sexual misfits that will most likely become very apparent in a culture with such rigid demands for identification with one out of two categories? Not belonging to a socially defined -and recognized category can cause an individual at lot of grief at all levels of social life. The heterosexual matrix sanctions deviation to its laws that claim causality and fixity as necessary for the interrelationship between sex and sexuality. Are the people in question paying too high a price to be living examples of the contestation of such a claim? Should medical science continue to ‘grant these children the right to a normal life?’ Are we “ *[...] sacrificing the well-being of unfortunate children on the altar of gender politics [?]*” (Fausto-Sterling 2000: 79).

In Western countries, the procedure following the birth of an intersex child has traditionally been to immediately declare a state of *medical emergency* (Fausto-Sterling 2000: 45⁶²). Within twenty four hours of birth, the infant’s sex has been assigned, a decision that is made

⁶² See also Fausto-Sterling 2000: 275f, Note 1 for an extensive list of medical articles in which the birth of an infant with ambiguous genitalia is described as a state of medical emergency.

between physicians (typically consulting a children's hormone specialist and a surgeon) and the parents (Ibid). While there are no international standards for exactly how the surgical intervention takes place, in most of these countries, there is a general consensus, that intersex children must be corrected to fit one sex immediately. *“Whatever treatment they choose, however, physicians who decide how to manage intersexuality act out, and perpetuate, deeply held beliefs about male and female sexuality, gender roles, and the (im)proper place of homosexuality in normal development”* (Fausto-Sterling 2000: 48).

The medical management of intersex today is still predominantly based on theories and praxis of the 1950's developed at John Hopkins University (Kelly 2007: 2), where the (in)famous sex-reassignment pioneer Dr. John Money (who played the leading part in the human experiment of what is often referred to as the John/Joan case: the sad story of David Reimer⁶³), at that time went to great lengths to prove his theory; that early correctional surgery was necessary and justified by the view of gender identity as malleable, that individuals are psychosexually neutral at birth, and that a healthy psychosexual development⁶⁴ is dependant on the appearance of genitals (Fausto-Sterling 2000: 70).

Standard Genitalia?

For starters, it must be stressed, that what figures within a range of normality, is defined by two intertwining aspects; what is most common and what is culturally proclaimed as desirable. As produced by and within the heterosexual matrix, our self interpretations -and evaluations are confined within -and compelled to the preceding measurements and standards of right/good and wrong/bad from genetically installed physical features to preference expressions. In the case of genitalia the question of right/good capability and appearance is interlocked with a discourse of compulsory heterosexuality:

“The medical model for treating intersex conditions asserts that males must have an “adequate” penis, generally defined as a penis capable of vaginal penetration and urination while standing. Consequently, most infants with ambiguous genitalia are assigned as females [...] An infant with a

⁶³ In 1966 Reimar, a male infant, accidentally had most of his penis burned off during what should have been a routine circumcision. At John Hopkins University, Money and colleagues advised his parents to let him undergo surgery. The baby had its testes removed and was raised as female. Money reported the reassignment as a success and for many years the true story of what became of Reimer was concealed from the public. It was later revealed that the experiment had failed; that Reimer, self-reported to have had suffered severe psychological damage, had assumed a male gender identity at the age of 14 (after having been told the truth about the course of his infancy) and lived as a man until he finally committed suicide in 2004, 38 years of age (BBC-1).

⁶⁴ The concept of 'psychosexual development' comes from Freudian psychoanalysis and refers to the process of libidinal drive development. A healthy development, within this theoretical outlook, is characterised by the absence of sexual frustration during the five stages of development, whereas disturbances may lead to neurosis.

large clitoris who is assigned as female will often undergo socially normalizing surgery to reduce her clitoris. An infant assigned as female with a small or absent vagina may have a vaginoplasty performed, although there is increasing support for waiting until adolescence to perform that type of surgery. An “adequate” vagina is defined as one that is large enough for penetration by a penis” (Kelly 2007: 2).

In other words; to be recognizable as male, you stand up while peeing and you penetrate women vaginally (with your normal sized penis that is). To pass as true female, on the other hand, well, your genitals complement that of the male. It is notable, that the notion of pleasure is conspicuous by its absence. So one may sexually appear and perform in accordance with normative standards of the sexual act, but for what’s and for who’s sake? Why *reduce* the size of a healthy, but larger than average clitoris, other than for the sake of averageness itself? It certainly has very little to do with with a maximizing of pleasure, unless the pleasure itself is reduced as a consequence of self-loathing stemming from being perceived as a misfit. Surgery in those sensitive erogenous zones is not without risk. Multiple surgery, as it is often required for a medically satisfactory result⁶⁵, are even riskier (Fausto-Sterling 2000: 85). Moreover -and importantly- the risk of traumatizing an unconsenting individual needs to be an all-pervading concern. The UN report states it unambiguously:

“There is an abundance of accounts and testimonies of persons being denied medical treatment, subjected to verbal abuse and public humiliation, psychiatric evaluation, a variety of forced procedures such as sterilization [...], hormone therapy and genital-normalizing surgeries under the guise of so called “reparative therapies”. These procedures are rarely medically necessary, can cause scarring, loss of sexual sensation, pain, incontinence and lifelong depression and have also been criticized as being unscientific, potentially harmful and contributing to stigma” (UN 2013: 18).

Some of those testimonies are taken up by Fausto-Sterling. The experiences reported by adult intersex people looking back on childhood memories include genital examinations with multiple spectators, physicians masturbating the child for the checking of penile function, insertion of dilators, and invasive questioning and physical examinations. Fausto-Sterling concludes that: *“[M]edicine’s focus on creating the proper genitals, meant to prevent psychological suffering, clearly contributes to it”* (Fausto-Sterling 2000: 86), a point that the UN report evidently supports, though a long thirteen years later.

In almost all of the cases stated above, another crucial factor of negative psychological development keeps surfacing: The withholding of information that the children has been subjected to. It has been normal procedure to advise the parents to conceal the truth(s) about the children’s conditions from them (Cornwall 2012: 4). ISNA-founder Cheryl Chase

⁶⁵ Between 30 -80 percent of children that undergo genital surgery, does it more than once (Fausto-Sterling 2000: 86).

was twenty-three when she discovered that she had been surgically 'corrected' to female (a complete clitorrectomy) at the age of eighteen months. She remembered having undergone surgery again at an older age. Here she had testicular parts of her gonads removed, but was told that she had been treated for hernia (Fausto-Sterling 2000: 80f). Her story is far from exceptional, and every intersex organization agrees, that the lying/withholding of information hurts a lot more than it helps (Fausto-Sterling 2000: 85). The secrecy and the lies contribute to feelings of shame and self-disgust, because of the taboo it implies. Ought the sciences and everyone else not take such unified voice, coming from the people with the actual experience of intersex, for a highly valid reason to change view and praxis?

Butler's point, that [...] *bodies only appear, only endure, only live within the productive constraints of certain highly gendered regulatory schemas*" (Butler 1993: xi) takes on a very literal meaning in the context of intersex management, and the medical approaches reveal what Fausto-Sterling rightly points out as a contradiction: the underlying assumption that *"behind a mixed child is a real male or female."* (Fausto-Sterling 2000: 76) What could be more real to medical science than what appears before us quite materially?

"We live in a highly gendered society in which scientists, physicians and laypeople alike strongly believe that men and women are fundamentally different, in spite of a wide range of evidence to the opposite. That children and young adults believe that one is either a boy/man or a girl/woman and that there is only one way to be either is understandable. That physicians hold the same beliefs and treat patients on their basis is not" (Joel, Tarrasch, Bermana, Mukameld, & Zive 2014: 315).

The medical management of intersexuality exemplifies better than anything, I think, how the material body is a site of power - quite intimately - and how hegemonic theories of sex and gender is conducting the conduct - and future conducts - of those that fail to meet the normative standards. Coming to this conclusion, however, does not sort out the dilemma initially stated. Will these children grow up as 'sexual rejects'? Possibly yes, but as intersex accounts of sex/gender and experiences are shared and spread out, as it has been the case since the 1990s, solidaric communities form and processes of empowerment take place⁶⁶. In this process, norms are tracked and attacked and new forms of expressions and new settings are made possible because of each other. I initially pointed out, that we cannot see beyond the forehead of others when we categorize them as we navigate through the world. Usually the same can be said about genitalia. Most of the people we meet (and I think this

⁶⁶ Intersex community groups and other coalitions has formed and expanded throughout the world since the early 1990' and many of the LGBT groups have added both the Q for Queer and the I for Intersex to their name (LGBTQI) as an acknowledgment of the shared goals between groups marginalized for reason related to sex/gender/sexuality.

counts as a statistical fact, though I have not verified it) will never expose their private parts to us.

Genitals - their appearance and function - matters socially, but thankfully - if they are otherwise healthy - being unusual does not entail a pleasureless life. There does not exist much evidence to support the (un)scientific claim that intersex people are doomed to a life of misery (Fausto-Sterling 2000: 93⁶⁷). First of all - and this needs stressing - there is a lot more to having sex than vaginal intercourse! If the sensation of pleasure is the goal of engaging in sex, there are numerous ways of achieving this, and obviously hetero-sex is but one form of sexual relation among others. It may demand a higher degree of communication⁶⁸ when one differs from the norm (the unspoken imperative), but communication is **a good thing** when we want to pleasure each other, nonconform genitals or not. I will not go further into the subject here, but merely drop a reminder, that the old erection-penetration-ejaculation idea of sex also has a history, and seeing that this course of action clearly does not describe the peak of female sexuality, guess which (equally old) system of thought is responsible for such stale notion of sex? Secondly, becoming (a) parent(s) does, as we have been over, not actually require that the people/person who are/is responsible for the upbringing, has reproductive organs at all. Despite this knowledge, the medical management of intersex largely maintains that the appearance of genitalia matters so much, that individuals at their infancy - far from becoming aware of themselves as potential sexual agents - will benefit from risky surgery procedures. When the risks involved are so immense and incalculable, why not let the person in question decide for themselves - at an age when informed consent is possible? The UN report speaks in clear a language:

“Children who are born with atypical sex characteristics are often subject to irreversible sex assignment, involuntary sterilization, involuntary genital normalizing surgery, performed without their informed consent, or that of their parents, ‘in an attempt to fix their sex’, leaving them with permanent, irreversible infertility and causing severe mental suffering” (UN 2013: 18f).

Legislation has to reflect the renouncing of the paternalistic violence currently taking place under the banner of solicitude. Most Western countries oppose female circumcision in (O)ther cultures and stand together in the outcry for putting an end to the abomination of female genital cutting (FGC). This includes Western feminist organizations. What a cultural

⁶⁷ See also Fausto-Sterling 2000: 94f where two different studies, one concerning the lives of more than eighty adolescents and adults having grown up with *visibly anomalous genitalia* and the other, presenting data on more than 250 adults born as intersex. Both studies suggest that the presence of ambiguous genitalia does not correlate with being psychologically unhealthy or not having a sex-life.

⁶⁸ Sometimes referred to as disclosure, a term I refrain from employing as I personally find that it incriminates something that ought not be incriminated.

paradox it is to tolerate it at home!⁶⁹ As long as the juridical system refuse to recognize infant genital-normalizing surgery as violent coercion, the ones who are left to make decisions on the behalf of the infant, are the parents. The rushed procedure of sexassignment and the authority of medical practitioners leaves many unprepared and uninformed parents bewildered and compelled to follow the recommendations. Who wants to be responsible for their kid's future misfortune? Education on intersex conditions must include - if not build on - intersex experiences. And medical practitioners need to give way -and give time, for parents to be fully informed. Efforts to change medical practice will continue coming from coalitions among various groups such as intersex people, academics, physicians, psychologist, and parents (Fausto-Sterling 2000: 81). In the meantime, parents should exercise the right to refuse surgery on healthy infants.

“If we choose to eliminate mixed-genital births through prenatal treatment (both those currently available and those that may become available in the future), we are also choosing to go with our current system of cultural intelligibility. If we choose over a period of time, to let mixed-gender bodies and altered patterns of gender-related behaviour become visible, we will have, willy-nilly, chosen to change the rules of cultural intelligibility. [...] Gender systems change. As they transform, they produce different accounts of nature” (Fausto-Sterling 2000: 76f).

Preliminary Conclusion

With this thesis, I have sought to account for implications of modern neuroscientific claims of sex difference that incorporates historical conceptions and the discursive powers at work in our efforts to name bodies by their difference from one another. I have engaged with various critiques of what I have named the brainsex discourse, coming from within the fields of natural sciences and neuropsychology themselves and made efforts to join them with feminist theories on sex/gender. My main concerns - and the motive for engaging with the topic - revolves around the prospect of a collective abolition of structural explanations for social inequality, that are necessary for bringing about societal changes that enables life 'outside' contemporary rigid norms of sex/gender expressions. It is important for sustainable developments that we hold sciences accountable for their normative implications. In relation to cultural variables, any descriptive knowledge also have normative implications - no matter how high-tech the equipment for analysis may be. Norms persist within methodology and guides the gaze; conducts the conduct. Technology may be developing rapidly, but common

⁶⁹ It has been pointed out, that *“[a]lthough the reasons for opposing genital surgery on intersex infants are similar to the arguments made by feminists opposed to FGC, anti-FGC feminists have failed to include surgeries on intersex infants on their agendas”* (Greenberg, Herald, & Strasser 2010: 17).

held beliefs about 'the order of things' certainly do not. Norms have the in-built potential for transformation. As Derrida said it: Meaning is always deferred. But the most tenacious ones congeals over time and fossilise as sealed truths. We have to insist on the history of sex as the constitutive background for contemporary views of sex if the very epistemological frame for thought is to be challenged.

Overall, I dare conclude, that the brainsex-theory -that men's and women's brains are hardwired differently: that men and women are *ontologically* different by default, has been dismantled. Brains are not isolated from the world around the body. I have moved from neuroscience to maternity to intersex as an effort to shed light on the relations between pleasures, knowledge and power that produces and disciplines us as sexed/gendered subjects. Neuroscience - as any science that poses questions about 'who we are' - are complicit with the establishment of the social structures by which we are compelled to interpret ourselves and each other. Science share the responsibilities for the future development of qualified answers to ethical issues such as 'equality' and 'freedom of expression'; "[...] *to build meanings and bodies that have a chance for life*" (Haraway 1988: 580).

The performative properties of 'identity' erases the artificial line between 'sex' and 'gender'. Matter and construct are inseparable in the conception of the body in the same way that we cannot separate the material brain from the discursive constraints that direct our behaviour. The human mind is sensitive to context and culturally concocted stereotypes are deeply rooted in the way we see and experience ourselves and the world, even at our most radical refusal of their validity. They are an integrated part of our consciousness, and we need to acknowledge them as such. Only then can we consciously act against them.

By employing a genealogical approach to notions of sex/gender, the chains of causality that frame and support hegemonic assumptions on which accounts of the real is resting, are exposed as fictitious. Research such as the recent study presented by Joel clearly points to the problems of these underlying normative assumptions, as they get in the way of discovering differences on a far greater scope. A much higher degree of awareness to processes of subjectivation is crucial for any 'descriptive' science to develop in a manner that enables subjects to differ from each other in a multitude of ways. We need different accounts of nature for that. The chapter on intersex shows that sometimes nature itself provides the 'material'. The conceptualization of the brain as mosaic puts an end to the sexual dimorphism that the brainsex theory rests on. Instead it gives rise to our reorientation towards the material-discursive reality of bodies that cannot separate different but

intertwining cultural variables, that all has part in what individual positions are available to us. Ideally, it compels us - scientifically and socially - to address questions of privilege. To abandon the traditional notion of objectivity is to level out an arbitrary hierarchy of knowledges and as a practical implication, shared perplexity takes over from universalistic narratives on 'human nature'. Historically feminist ideology has paved the way for the critical interrogation of privileges in relation to structurally installed hierarchies and divisions of work and this struggle continues as we engage with masculinist/(neo)colonialist claims to truth - whatever wrapping they may come in. The neurosexist definition of equality that translates itself into the highly dubious 'different but equally valuable' view on the sexes, obstructs the potential for different but equally valuable subject *positions*. The idea of two complementary sexes ought to be written off as heterosexist, masculinist thinking. In studying individual differences, sex/gender should certainly be treated as a factor, but assuming that it is - a priori - the most important factor is either a sign of 'bad science' or 'bad faith' (if not both). By the latter, I refer to political inclinations stemming from conservative and reactionary worldviews (ideologies) that inherently insist on the maintenance of the artificial and arbitrary hierarchy, in which subject positions are historically arranged.

Part IV

Privileged Conceptions and Resistance

For the final chapter of this thesis, I want to discuss some of those privileged conceptions that serve the narrative of men and women's alleged brain differences that are not immediately present in the claim, but that I consider important for a re-conceptualization of the socio-political appraisal of human qualities and preferences, that does not rely so heavily on the masculine-feminine distinction, but at the same time, does not do away with it entirely. With respect to the time horizon implied in the theoretical outlook, changes in the way we think about identity categories will not come about abruptly, which is why the most constructive approach to the task of incorporating feminist ethics in science, as well as in our day to day lives, must take its forward looking point of departure in what 'exists' within contemporary discourse. I understand feminism to be the theoretical and practical efforts towards creating equal worth between expressions and contributions to social and professional communities, that are traditionally thought of as feminine and masculine. Femininity is historically devalued from that of masculinity - why the prefix is 'Fem' and - not

as paradoxical as it may seem firsthand - also why men ought to support the feminist project for their own sake. I will return to this point and elaborate on why I believe this to be the case, but first - and for the sake of endorsing my argumentation - i want to discuss the distinction between men and women with respect to 'intelligence' and 'morality' as they appear in the brainsex theory, followed by suggestions as to how the feminist project turns theory into praxis.

With the questions related to brains/minds/psyche/consciousness (terms that overlap extensively in the cases where they are not identical with one another), the body is the necessary component to the establishing of identities that consequently are multidimensional and temporal - and deeply reliant on perception (self-perception and perception of others in a mutually constitutive and productive order).

Stable identity-categories are in this view harmful reductions, but in order for the exchange of meaningful conversation, we need categories - conceptual notions - for linguistic purposes. However they must be drained of their seeming naturalness and stability if we are to expand the realm of the intelligible. We can start by removing sex/gender as predictor for notions/conceptualizations that ought not to rely on a sex/gender distinction to begin with. It would seem that the human brain is one of them.

In my previous discussion of parenting and childcare, I argued, that ethical mutuality and relationality consist in motivation and acts associated with the full spectrum of reason/emotion (that ought not be thought of in isolation from one another), because (embodied) ethical action, does not imply any division in praxis.

There are striking parallels between the different expectations for mothers and fathers, and for women and men in the workplace. The brainsex discourse that ostensibly values men and women's different qualities equally, holds that 'intelligence' is equally distributed between men and women on a large scale - a claim that is supported by standard IQ statistics (Levy 2004: 319). Philosopher Neil Levy contributes to the critique of the brainsex theory represented by Baron-Cohen in a review of Baron-Cohen's aforementioned book; *The Essential Difference* (Baron-Cohen 2003). Levy questions the basis for the suggested division of work and his main objection addresses the idea, that men make the better cognitively equipped scientists, mathematicians etc, i.e professions demanding high levels of systemizing ability. Levy argues:

"[...] human intelligence is not essentially rule-governed manipulation of symbols, mere systemization: it is also, and more importantly, the capacity to see what matters in a situation, to grasp what is relevant and what is not. We apply our thick concepts to a world understood as already patterned in

ways that are meaningful to us. Our intelligence is not a systemizing capacity; it is rather something much closer to what Baron-Cohen understands by empathizing: the 'drive' to understand the world, and to react appropriately, not the 'drive' to systemize it from a position outside and above it. [...] For both systemizing and empathizing are likely to be necessary, for skillful performance and innovation, even in the sciences, and therefore a high degree of skill in one is unlikely to compensate for a relative lack of the other" (Levy 2004: 318).

It is interesting to observe, as Levy does, that the notion of empathy has two equally important components. Cognitive empathy translates into what for the sake of simplicity could be called 'mindreading': the ability to detect other people's emotions and needs. However, in order for such a quality to lead to appropriate (ethical) action, cognitive empathy needs an affective component that assures, that the information about another person's emotional state, will not be taken advantage of in the service of self-interest (Levy 2004: 316). Neither 'mindreading' nor systemizing alone secures action, and thus acts directed at *altering the world* - an ability Baron-Cohen attributes predominantly to the male brain - would seem to require cognitive skills that the brainsex theory associate more strongly with the female mind (Levy 2004: 318), especially it could be added, if the alterations in question are to be motivated by a want for greater social equality. As such, affective empathy comes across as another term for 'morality' (Levy 2004: 313). Moral reasoning is proven to be sensitive to the context in which the particular dilemma takes place (Fine 2012: 24) and I think it is safe to say that within a wide range of contemporary philosophy, morality is seen as historical and relative to context, not as a universal and intrinsic property of the human being. Hence the call for fluidity in the concept of morality rather than the dichotomous divisions of disembodiment/embodiment.

The Notion of Intelligence

Levy argues, that Baron-Cohen's thesis relies on a superficial notion of intelligence that basically denies 'reason' and 'intelligence' the characteristics of being embodied and situated, which consequently over-simplifies the concepts (Levy 2004: 215). Although Baron-Cohen holds that both systemizing and empathizing are aspects of intelligence, and that no sex can be said to be more intelligent than the other, his theory informs us, that we can expect men to have advantages in areas of innovative development, why it is also only *natural* that men tend to be over-represented in fields of 'hard' science. As we recall, Baron-Cohen's theory suggested that women (on average) - and due to their supposedly better language skills (that correlates with women performing better than men on the verbal parts of the IQ test) and empathy - are best fulfilling their potential by occupying positions that require social/caring skill, or more to the point; work areas that are traditionally

female-dominated (and traditionally less rewarded - both financially and in regards to social status). Levy questions whether the cognitive ability to systemize and the knack for innovation really can be said to go hand in hand. He draws on the insight of Thomas Kuhn for an exemplification of how, historically, the multifaceted qualities of embodied intelligence, have brought about important paradigmatic breaks. Here notions of intelligence, innovation and intuition necessarily works together.

*"[...] Kuhn and others make clear, [that] innovation requires this prior intuitive grasp of the domain. For Kuhn, scientific revolutions occur when anomalies accumulate to such an extent that they overwhelm a normal scientific paradigm. Though normal scientists, because they see the physical world in a particular gestalt, resist seeing these anomalies, nevertheless they are far better at articulating them very precisely when they do perceive them, **because** of their paradigms: 'Anomaly appears only against the background of the paradigm'⁷⁰" (Levy 2004: 319).*

The main thesis, that men are generally better at understanding - and building - systems *because* of their (hardwired) advantage in matters of rule-governed manipulation of symbols, is repudiated, as it is the ability to "*grasp situations in the appropriate gestalt*" (Levy 2004: 320) that enhances *performance* and leads to the innovation of sciences. In Kuhn's own words, there is quite the difference between research science and innovation:

"Under normal conditions the research scientist is not an innovator but a solver of puzzles, and the puzzles upon which he concentrates are just those which he believes can be both stated and solved within the existing scientific tradition" (Kuhn 1977: 234).

Instead of centering the notion of intelligence around high systemizing ability, Levy foregrounds the ability to detect *what is relevant in a domain* (Levy 2004: 322). Systemizing and empathizing abilities (in the way the terms are employed in the brainsex-discourse) are both important qualities (in science, innovation, parenting, and every other aspects of life), but having greater cognitive ability in one does not bring advantages in practice, if it is at the expense of the other. Crudely put: understanding a system does not naturally lead to appropriate action, and action without the understanding is not naturally appropriate. Even if it was safe to trust the male-brain - female-brain continuum as our biological outset, the work division implied, simply cannot be defended on its own theoretical ground. Our individual sex/gender status in the social world **is** greatly (but not exhaustively) determining for the possibilities available to us, but for reasons that are culturally constituted: barriers that have the inbuilt potential for transformation. Privileged conceptions of sex/gender has obscured other factors of diversity and sameness, and as such both continue to justify disparity between women and men and silence other narratives in which a range of cultural variables

⁷⁰ Levy citing Kuhn (Kuhn 1996: 65).

determine our positions in the established hierarchies and importantly: where the very questions regarding the desirability of the hierarchy itself, are kept from the surface.

The Binary System Fails Again

I have included Levy's objections to the brainsex theory in order to put a final emphasis on how a particularly powerful system of thought is supported by the language it employs. The binary system of categorization works as a signifying economy that grants value to the signified, in a way that is not actually supported by empirical knowledge. The brainsex theory is exposed as the endeavour to fit the phenomenological world into already established webs of belief, not the other way around. What appears to be reality in turn justifies and perpetuates particular truth claims that become institutionalized representations of 'who we are', and simultaneously prescribes the normative ideals for living according to the boxes available to us.

When the material world supports a view on human brains as characterized by substantial variability rather than fitting the categories, it is the implicit appraisal of artificially encapsulated traits of personality that is wrong. In the history of philosophy, the critique of the binary worldview goes a long way back, as various schools of thought have pointed to the situational properties of knowledge long before any notion of a postmodern era was conceived of. However, as I hope to have demonstrated, the residues of Cartesian conceptions remains and linger within the language-structure that still associate masculinity with consciousness, rationality, authority, activity and power whereas femininity is marked by its oppositional characteristics; body, emotion, passiveness and lack of authority and power. As such, they have material-discursive effects that have very real impact on people's lives.

The conjoining of feminist theory and neuroscience allows science to seek the answers to the properties of human brains and patterns of behaviour through mutual exchange that promotes an appreciation for biological and cultural diversity without the need to arrange acts and preferences in a hierarchized and gendered order. Adopting the mosaic-brain theory, I think, could be an important step in that direction, because the conception of preferences as something already gendered from the beginning will be dissolved prior to the inquiries into cognitive and behavioral differences. This way we can find out much more about brains, bodies, environment and behaviour.

The Fluid 'We'

The points made throughout this thesis invites critical self-reflection about our own positions - and the positions of others (available as well as occupied). As already stated, what rises from the ashes of rejected notions of male and female brains are first of all questions in respect to fairness and innate privileges.

Privileges follow the logic of the hierarchized system of categorization and in order for discourse to enable liveable lives at a far greater scale than what is currently the case, excluded and/or underprivileged categories needs space and exposure. Ideally what follows are the material-discursive emergence of identity categories that are yet unthinkable - abject - within contemporary discourse. That is the main motivation for the efforts to drain gendered categories of their substantial appearance. As I have repeatedly stated, such attempts calls for solidarity, which must manifest itself in many forms: By the privileged voices stepping aside to create space for oppressed voices. By enabling visibility by promoting - not speaking for - other voices. By insisting on people's lived experiences as useful knowledge and putting various knowledges to use in the inquiries into the categories they represent in the context of the inquiry. By refraining from notions of absolute knowledge. By critically interrogating one's own privileges and the privileges of others. Ask yourself this: By taking space in a specific context, am I at the same time denying others the space? - and if so, who is silenced?

These are implications of the epistemological turn that informs us of the mechanisms by which we come to exist as subjects in the world, how we are produced and how we take actively part in the reproduction of the structures that determine our lives and finally, how we manage our struggles for emancipation.

Solidarity, as I understand Haraway, entails a 'we' who speak, [...] *not of a common language, but of a powerful infidel heteroglossia* (Haraway 1991: 180). This 'we' is neither a homogeneous nor stable unit and it does not exclude any particular sex/gender in the act of joining forces. It is a dynamic multitude of experiences, voices, and knowledges entangled in the power relations that occur where they take place. 'We' are never fixed in time and space. The 'we' consists in affinity that does not cover up its internal contradictions in order to speak in a unified voice. It employs categories. It discusses categories. It multiplies categories. It listens to and promotes the voices of the actual people that take part in whatever category is relevant for discussion. It allows individual participation in multiple categories. It is aware that

categories are socio-political power-tools; double-edged swords for both domination and resistance, in science and in our social spheres.

I have inquired into different modes of sexed/gendered subjectivation: mechanisms by which we are materially and discursively tied to our particular bodies, general representations, and cultural expectations. From the Foucauldian analysis we can gather, that our potential for what he calls freedom - but what I would rather call resistance, though in his theory they constitute each other - lies in the capacity to shed light on the historical links between the modes of self-interpretation and dominating relations of power and knowledge in our contemporary contexts - and to defy the certain classifications that dominant discourse has (always already) identified us by (Sawicki 1991: 43). Butler's further theorization that illustrate the terms of hetero-normative performativity and the power of language to create the socially real through citation and iteration (Butler 2007: 156), coupled with Haraway's emphasis on solidarity between situated knowledges, sketch a domain for resistance, where the "*anarchist struggles*" (Foucault 1982: 781) can take on a more organized form - without being detached from their locality and obscured by the illusion of homogeneity and universalism. The question of how we bring forth differences and how we name them has to be an ongoing development that indeed benefit from the strategic and temporary collaborations between various groups of affinity. Foucault is right to point out that there is no 'chief enemy' as such, but if 'we' can agree that certain persistent norms are in need of being revised, then 'we' can make efforts to speed those local processes by promoting different causes under the banner of social change, while we exchange and learn from each other.

The ever increasing critiques of the tyranny of norms that arbitrarily decrease the social value of non-conforming identities are contributing to the awareness of social injustice, that goes well beyond people's monetary situations (class-distinctions obviously define possibilities for actualization of conduct, my point here is the awareness of privileges that are not as visible to people that have them, because they are structurally given and not necessarily a product of wealth). The internet has been the site of the formation of many groups of affinity and has given rise to a vast variety of voices that would have remained unheard in a system that otherwise primarily allows space for already powerful voices. This of course, is also true for voices and groups of affinity gathering around the resistance to what I call 'the explosion of the binary'. In Danish discourse, discussions in regards to ethics of equality have more recently undergone a twist that has resulted in a sort of

'men's-rights-movement' that portray men as 'losing the equality game'. I will not waste my time on ideological traditionalists lamenting the loss of fixed orders and advocating old fashioned gender-roles. I do, however find it interesting to consider the impact on the roles for men in a possible post-explosion era. The awareness of privileges implies a process of critical self reflection and the unlearning of certain privileges, more or less voluntarily. The white man; the generic Firstness; the objective voice of reason; looking to lose this powerful position. How should *he* feel about all this?

The Ideology of Masculinity

"In every arena—in politics, the military, the workplace, professions and education—the single greatest obstacle to women's equality is the behaviors and attitudes of men. I believe that changes among men represent the next phase of the movement for women's equality—that changes among men are vital if women are to achieve full equality. Men must come to see gender equality is in their interest—as men" (Kimmel 2005: 102).

Sociologist Michael Kimmel - an upper middle class, white male - points to a societal difference between the lives of men and women, that is brought about by the history of women's rights development⁷¹. He argues, that while the lives of women have undergone dramatic changes within the last century⁷², men are generally stuck within an ideal of masculinity that has not changed accordingly (Kimmel 2005: 104). This, he claims, presents a great problem, not only for the further actualization of the feminist project, but also for the possibilities for a higher degree of freedom for men.

Kimmel argues that while the societal changes brought about by women's movements have had great impacts on the lives of men, the masculinity ideals: notions about 'what it means to be a man', have not been properly rethought and revised. This places the (post) modern man in a confusing situation to which he reacts in non-constructive manners. Kimmel examines traditional notions of masculinity and brings out four 'rules of masculinity' that he argues, are still highly dominating points for orientation for men's sense of identity. First, *"masculinity is based on the relentless repudiation of the feminine. Masculinity is never being a sissy"* (Kimmel 2005: 105). The second rule is *"Be a Big Wheel"* (Ibid); the traditional

⁷¹ Kimmel mainly addresses history and issues concerned with the development in regards to women's rights and feminism in a Western context, the US more specifically. I have chosen to include parts of his argumentation in order to comment on the prospects of transformation of prevailing masculinity ideals, despite my scepticism towards his use of generalization.

⁷² Kimmel points to four major changes: Women making gender visible, women joining the workforce, women's efforts to balance family and career and finally women changing the sexual landscape by having claimed the entitlement to pleasure (Kimmel 2005).

markers of masculinity: wealth, power and status define the 'real man'. Third rule of masculinity: *"Be a Sturdy Oak. What makes a man a man is that he is reliable in a crisis. And what makes him reliable in a crisis is that he resembles an inanimate object - a rock, a pillar, a tree"* (Ibid). The last rule Kimmel includes is summed up by an imperative of boldness and aggression: *"Give 'em Hell"* (ibid). A 'real man' is not afraid to stick his nose out (even when boldness turns into stupidity I might here add. The line between the two sometimes appear paper-thin). He takes risks - and he takes up space.

The argumentation is obviously simplistic and reductive, but in the light of the many social implications for sex/gender roles derived from the brainsex hypothesis, I think it is useful for the conceptualization of another kind of stereotype threat than that conditioning *"the female mind under threat"* (Fine 2012: 32), that may not *impair* the male mind in traditionally male-dominated spheres, but certainly does not give him any advantages in a society characterized by a high degree of gender equality. In any case it has formative qualities in terms of identification and the restrictions of the category are blatant.

"We chafe against the edges of traditional masculinity, but seem unable or unwilling to break out of the constraints we feel by those four rules. Thus, the defensiveness, the anger, the confusion that is evident everywhere. These limits will become most visible around the four areas in which women have changed most dramatically: making gender visible, the workplace, the balance between work and home, and sexuality. They suggest the issues that must be placed on the agenda for men, and a blueprint for a transformed masculinity" (Kimmel 2005: 105f).

The issues we are facing today, in order to bring about discursive changes with reference to masculinity, has to do with the implicit Firstness of man as I have already discussed to some extent. It remains a political process to make gender visible to men, Kimmel rightly argues: *"[...] though we now know that gender is a central axis around which social life revolves, most men do not know they are gendered beings. When we say "gender," we hear "women"* (Kimmel 2005: 106). 'The generic Firstness' himself is unaware of his position. He takes it for granted. Such is the privilege of privilege:

"The privilege of privilege is that the terms of privilege are rendered invisible. It is a luxury not to have to think about race, or class or gender. Only those marginalized by some category understand how powerful that category is when deployed against them" (Kimmel 2005: 106f).

Men's needed realization of sex/gender as formative principles that structure our lives is opposed by the 'rules of masculinity', especially the imperative not to be a sissy. The demand for boys and men to prove to their surroundings that they are not weak (not girl-ish - not gay), creates a mainstream for boy-ish activity, preferences, and active (performative) traits of personality by which - especially male adolescents - refuse feminine markers solely

for the reason, that they are considered feminine. As has been shown by Fine and others in this thesis, traits like ambition, competence, competitiveness and aggression are coded as masculine, whereas the oppositional 'soft' values and traits are characteristics of the stereotypical female. The heterosexual imperative upholds this artificial distinction and demands complementary and co-dependant oppositions to join in union: a totality that exhibits both types of a token in a yin-yang relation, in which one without the other is defined negatively. Kimmel touches upon something I find crucial for coming to a constructive understanding of how and why many men perceive feminism as a threat. Obviously, when equality calls for a levelling of privileges, this in itself can be the cause of worry for the historically installed Firstness. However, I think that Kimmel is right in his approach by which he recognizes, that it is men's sense of entitlement - produced and supported by the idea of masculinity as activity, aggression, and high status (economically and socially) - that has to be addressed and made visible. He exemplifies with following anecdote:

"Now, remember, during the current economic downturn, fewer and fewer men are feeling much like big wheels. And here come women into the workplace in unprecedented numbers. Recently I appeared on a television talk show opposite three "angry white males" who felt they had been the victims of workplace discrimination. The show's title, no doubt to entice a large potential audience, was "A Black Woman Took My Job." In my comments to these men, I invited them to consider what the word "my" meant in that title, that they felt that the jobs were originally "theirs," that they were entitled to them, and that when some "other" person—black, female—got the job, that person was really taking "their" job. But by what right is that his job? Only by his sense of entitlement, which he now perceives as threatened by the movement toward workplace gender equality" (Kimmel 2005: 109).

Roughly put; men have not adjusted to the idea of gender equality because they feel that women take something from them that is rightfully theirs. Faced with the potential for amputated manhood - for instance the prospect of losing his status as provider and protector - he reacts with violent dominance and conservatism. This position, Kimmel argues, is blind to what is potentially gained in a new situation, as it has its sole focus on loss. It is a misconception that impairs men in their quest for leading fulfilling lives. In the more fluid view on morality, preferences, and traits it is not of great importance which gender does what, as long as we live up to our responsibilities as people in caring relations. The archetype man that appears between the lines of the rules of manhood is mainly concerned with status, wealth, and power. Real life examples of the dominant and power craving man most definitely exist. However, notions of 'the modern man' are often much softer in their characteristics. According to Kimmel, modern man wants to benefit socially/emotionally from his intimate relations: fathering, friendship, partnership - a process that is greatly sabotaged by traditional notions of what it means to be a man (Kimmel 2005: 110). Reliability in modern relationships is not reducible to the masculine traits conceptualized in the metaphor 'the sturdy oak'. A greater level of gender equality will positively assist men in gaining better

relationships as we will no longer be directed by norms that simply put, make him unavailable in emotional matters and her incompetent in anything else. Sharing the responsibilities - at work and in the home - will enable both men and women to invest the time and nurture that forms the basis of mutually caring relationships and ethical action towards others - including paying the bills.

“ [...] it is not “quality time” that will provide the deep intimate relationships that we say we want, either with our partners or with our children. It’s quantity time—putting in those long, hard hours of thankless, unnoticed drudge work. It’s quantity time that creates the foundation of intimacy. Nurture is doing the unheralded tasks, like holding someone when they are sick, doing the laundry, the ironing, washing the dishes. After all, men are capable of being surgeons and chefs, so we must be able to learn how to sew and to cook” (Kimmel 2005: 110).

An implication of these prescribed changes obviously demands of women too, that they ‘loosen up’ in regards to the identification as main caretaker. Mutuality is - at least - a two way direction. Women that are serious about sharing responsibilities must also be willing to step back in the domestic sphere. I have discussed notions like ‘the second shift’, ‘the motherhood penalty’, and more generally modes of ‘female subjectivation’ from the perspective, that these structurally installed power mechanisms work as obstacles for women’s struggle for emancipation. However, the positions available to women offer power in other domains than those traditionally perceived as masculine. Men taking steps back in public spheres means women stepping back in domestic spheres. As discussed earlier in regards to maternal subjectivation, mothering is discursively linked to her supposedly intrinsic and instinctive caring skills. If we are right to dismiss such essentializing claim, it must also be defended, that fathering can be every bit as caring and responsible. It would be a matter of allowing for parental equality and in that sense, I think women have a major responsibility to include men. A somewhat tangible example would be the managing and distribution of parental leave⁷³. The processes of subjectivation that historically has positioned men and women differently will not undergo abrupt and instant transformations. Rather, the prospect of more fluid distribution of roles, demands time for learning, unlearning and gradual adaption. What to men might now seem like a risk of loss, needs to turn into a promise for potential enhancement. Kimmel concludes rather optimistically:

“We, as men, should support gender equality—both at work and at home. Not because it’s right and fair and just—although it is those things. But because of what it will do for us, as men. At work, it means working to end sexual harassment, supporting family-friendly workplace policies, working to end the scourge of date and acquaintance rape, violence and abuse that terrorize women in our societies. At home it means sharing housework and childcare, as much because our partners demand it as because we want to spend that time with our children and because housework is a rather conventional way of nurturing and loving” (Kimmel 2005: 114).

⁷³ Of course this is not just a matter of people privately coming to agreements, it is highly political and the practice of sharing parental leave has to be supported and encouraged from an institutional level as well.

The discussion taken up by Kimmel revolves around the sociology of men and women in interconnected relations and as such take place within a framing of society, that does not consider alternatives to the heterosexual organization of family and partnership. I think that the path towards greater equality in heteronormative settings can be made more passable by looking to alternatives for inspiration. In Butler's terminology and view it is through the exploration their 'constitutive outside' that normative assumptions face their greatest challenge. I do not mean to imply that other ways of organizing family and partnerships are necessarily *better*, or even more equal in general, merely that the existence of other forms of coexistence and other experiences underline how 'normal' is just another word for usual or most common, and that unusual and uncommon are ways of doing things, that rely on other premises and practices that might gain new appeal in a transformed sociopolitical landscape. The explosion of the binary worldview brings along its own difficulties, but the endless multiplication of non-essential accounts of bodies and possibilities for identification it prompts, does offer a promise of a future, in which diversity and the freedom to express oneself differently in terms of ethical models for organising our social lives, work lives, and sex lives, are valued favorably instead of seen as a threat. Feminism is about creating this possibility. It is not a women-against-the-men doctrine. Feminism seeks to disassemble certain privileged conceptions that keeps people locked in sexed/gendered patterns that sex/gender really should not be decisive of at all. Mosaic brains in unique bodies come into existence in ways that inevitably categorizes us in various ways, and in accordance with various normative standards, that surely precede and produce us in certain ways, but because of their temporal properties, always carry the potential for transformation. Dominant discourses have complicated material origins, which make the discovery of their history and genealogy pivotal to the understanding of how the categories are not simply a product of our ancestors naming the diversity they saw in nature, but indeed discursively instituted to create hierarchies: bodies marked by superiority and inferiority in relation to each other. Intersectional feminism challenge such traditional orders: First by elucidating their arbitrariness. Secondly by forming alliances of ethical action for the purpose of enabling people to break with the constraints of their culturally given positions, an effort to enable a bottom up direction of knowledge, and simultaneously refuse the top down direction of the hegemonic system of categorization.

Sex/gender is but one of the analytic categories that produce, position and restrict us, constituted by the relation between a body's capability and what is socially required by it. On the question of neuronal sex difference, as discussed throughout this thesis, neuroscience has not been doing a convincing job at exploring the impact of the latter. Neurosexism is the

result of scientific negligence and/or conservative unwillingness to contest existing meanings within hegemonic discourse.

Paradigmatic Crash Ahead?

“Unanticipated novelty, the new discovery, can emerge only to the extent that his anticipations about nature and his instruments prove wrong” (Kuhn 1996: 96).

It is worth noticing, that popular discourse on brainsex does seem to be under development in a way in which it is ostensibly absorbing critiques such as those presented in this thesis. One of the indicators of this being the case, is rather explicitly present in the comparison between the lines of argumentation in two educational BBC documentaries on sex in the brain: The earlier one from 2005; from the series *Secret of the Sexes*, episode 1; *Brainsex* (BBC-2) and the later from 2014; *Is your brain male or female?* (BBC-3). In the early documentary, the brainsex hypothesis is presented as factual knowledge. Among other assigned experts, Simon Baron-Cohen (BBC-2 32:12) and Ruben Gur (BBC-2 18:42) present the evidence to support it. Its subtitle, *the real truth about men and women*, promises unambiguous answers and throughout the episode, neuroimaging studies are celebrated as bias-free evidence, that stereotypical representations of men and women indeed reflect reality. Almost ten years later, the tone has changed dramatically. Now, instead of *telling* the viewer how brainsex manifests behaviorally, the viewer is invited to consider different accounts of gender-manifestation - one side leaning toward the theory of hardwired sex difference and the other side emphasizing social/cultural impacts on brain-structure and behaviour. The arguments and research is presented in a debating form that does not immediately favor one view over the other⁷⁴, though there are of course many questions to investigate in terms of the framing of arguments as they appear, that I will not pursue any further. I mention these documentaries, however, because of how the development from one to the other underlines the significance of critical interrogation of ‘truths’ as they are presented to us by science - along with the necessity for interdisciplinary collaboration. I find BBC to be representative of the image of ‘what trickles down into society’; a discourse on sex/gender in which earlier taken-for-granted assumptions are in the

⁷⁴ Instead of one narrator, there are two presenters, a male and a female. Dr. Michael Mosley and Professor Alice Roberts test and discuss the neuroscientific research on sex-differences along with socio-cultural impact on brains and behaviour. At the end of the tv programme they take stock and come to at least one agreement:

Roberts: *“I’m not saying there aren’t any innate differences, but they are small and they only explain a tiny bit of the variation between individuals”* (BBC-3, 57:51).

Mosley: *“Yeah, absolutely”* (BBC-3, 57:59).

process of being stripped of their biological necessity. The continuation of this process bears with it a significant potential for social change, slow as it may prove to be.

The importance of a change needs to be stressed. The convulsive insistence on tradition that shrouds the idea of dimorphic sexes, turns the blind eye to the violence that flows from its leading notion. The implicit inferiority that marks all but the generic Firstness brings with it justified contempt - blatant and/or subtle. Men violating women and hate-crimes targeting gender/sexual minorities continues to be a massive structural problem, that must be taken seriously. The norms are violently forced upon individuals in many ways depending on context and identification; physically and symbolic. It disables people in their pursuits of living the kinds of lives they want to, or at least to break with stereotypical representations and gain awareness of alternative ways of conducting oneself. In this thesis I have inquired into some general perspectives on the bodies and lives of what can be considered 'normal' as well as lives situated outside the norm. By pointing to issues of intersex, I have attempted to contest the biological paradigm on its own ground. I could also have taken up issues in regards to transgenderism⁷⁵, and the politics and discourses surrounding non binary sex/gender identification as well as expressions of sexuality, that deviate from privileged conceptions of what it is to engage in sexual relations. Many lives exist within the paradox of being 'damned if you do, damned if you don't'. Or in other words; either you live up to the stereotypes that govern processes of identification and lose the ability to act beyond it, or you break with them and risk sanctions. The binary worldview and the stereotypical representations that derive from it, is not about to terminate anytime soon. What is needed in the meantime is affinity and solidarity. Knowledge about the power invested in the categorization of sex/gender allows us to become aware of the terms by which we exist in the world, how we experience the world. We categorize inevitably, and this is important to be aware of. No one obtains a position from the outside, because there is no such thing as an outside accessible to us. No one sees everything from nowhere. To take responsibility for how we learn to see demands our individual awareness of our own complicity in the reproduction of norms and stereotypes. I have noticed that the term 'political correctness' is often being deployed as a means to ridicule. Many people seem offended by demands for making privileges visible and they respond defiantly to the 'self-policing' that follows. I would like to strike a blow for 'political correctness' in the sense that I believe, that in many instances, we need to stop viewing it as

⁷⁵ Transgender communities have been the source of highly interesting debates on sex/gender expression and identification. While a great many transgendered people make efforts to fully pass as one of the binary sexes - leaving the prefix *trans* to mark the process of transition - to something that might eventually be overcome (heavily debated in various queer environments and problematised as reproduction of the norms that govern culturally sextyped behaviours), others claim transgenderism as their desirable and consistent sex/gender identity that feature ambiguity of expressions: bodily and in terms of preferences.

self-censorship and instead label it *common sense* with the intent for ethical action towards others. Is it too much to ask that we - with the knowledge available to us - make an effort to refrain from acting towards one another on the basis of stereotypical representations? The possibility of a shift of paradigm in regards to sex/gender is decided by the degree to which society is willing to abandon certain privileged conceptions and accept new ways of seeing -and naming difference. Neuroscience has great potential for assisting such development of thought.

Conclusion

I started out by stating the question: *How can feminism provide an ethical response to neuroscientific claims about hardwired sex differences in the brain?*

Ultimately, the critical interrogations of such claim come from a variety of schools and sciences and it is worth noting that neuroscientific researchers have undermined the claim themselves by exposing the human brain as 'mosaic'; characterized by substantial variability rather than fitting the two-sex-system. However, the way that a particular research study is structured relies on methodology and methods relies on theoretical assumptions. As theoretical starting point, intersectional feminism(s) point to the arbitrariness of culturally installed material-discursive hierarchies and work against the binary and dialectic worldview and by doing so enable diversity on a much greater scale. Diversity is a fact in the world, but the way we as societies - from general rules of science to our most private spheres - name difference and how we act on notions of difference must be informed by epistemologies that manage to reflect the realization and acknowledgement of how a subject is produced and produces. If we are to challenge the structures that render some bodies and/or identity-expressions more valuable than others on false presumptions - and as such seek to make lives more liveable for non-conforming bodily expressions as well as enable people in general to break with the constraints of stable categories - neuroscience needs to pose new questions and seek new answers, instead of chasing outdated stereotypes.

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