The politics of plasticity: Sex and gender in the 21st century brain
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Conclusion

This study critically examines how sex and gender are imag(in)ed in the 21\textsuperscript{st} century brain. It builds on feminist scholarship that has critiqued the claim that sex differences in the brain are hardwired and dichotomous. Specifically, it enters into a conversation with neurofeminist work that has advanced brain plasticity as a major challenge to brain organization theory and as a desirable and necessary alternative research direction. Noting the shared history between brain organization theory and the (re)discovery of neurogenesis, this study asks, amongst other questions, to which extent plasticity is already taken into account in scientific, political and popular representations of brain sex, and to which effects.

A recurrent finding in this dissertation is that, across multiple contexts, plasticity is conceptualized as a property of sexed brains. As such, plasticity is acknowledged whilst brain sex is kept firmly behind a ‘neurobiological line of defense’ (Rubin 2009, 419) that separates the fixed from the flexible. In Chapter 1, I have discussed how studies of environmental enrichment and of oestrogen actions in the brain use brain sex to ground and organize observations of neuroplasticity. In Chapter 3, I have read the claim that ‘boys and girls learn differently’ (Gurian et al. 2010 [2001]) as a claim about sex differences in plasticity, which enabled me to account for the success of brain-based boy advocacy. In Chapter 4, I have discussed maternal and paternal plasticity, which have given rise to the notion of a ‘bisexual’ or unisex brain. The continued use of the terms ‘maternal’ and ‘paternal’, however, presents yet another incarnation of ‘sex differences in plasticity’. Finally, in Chapter 5, I have discussed how the female brain is constructed as inherently at-risk due to its hardwired sex, yet at the same time plastically responsive to lifestyle adjustments with which women are encouraged to pro-actively manage their brain health. In addition, this chapter briefly considered a recent claim that sex/gender differences in autism might be understood as the result of sex differences in plasticity (Mottron et al. 2015).

Amidst the veritable hype plasticity has unleashed at the turn of the 21\textsuperscript{st} century, the claim that sex differences are hardwired into the brain appears decidedly old-fashioned. The successful persistence of this claim could be attributed to the endurance of a traditional gender ideology that requires biological determinism as its foundation. However, the analyses provided in this dissertation suggests that the enlistment of plasticity as a property of male and female brains also contributes to the continued acceptance of brain organization theory. By incorporating plasticity, this theory appears—at least superficially—as less deterministic since
it locates sexual difference at the level of brain circuits rather than at the level of behaviour. By fusing themes of determinism and freedom, this conceptualization of brain sex affirms femininity and masculinity as natural essences, but it is also capable of accounting for recent shifts in gender roles. For example: arguments that explain women’s underrepresentation in STEM fields by pointing to innate differences in math aptitude (as Harvard University president Lawrence Summers has infamously done in 2005) cannot easily account for time- and location-dependent shifts in the gender math gap. Arguments that focus on sex differences in learning style or brain maturation, however, can account for such shifts by linking them to changes in educational practices, and are therefore more agile and robust.

Furthermore, this study shows that this fusion of determinism and plasticity aligns neurosexism with a neoliberal, postfeminist sensibility (Gill 2007; McRobbie 2004) which affirms sexual difference as a natural essence but also thematises gender equality and self-determination. In the name of empowerment, freedom and self-indulgence, this sensibility encourages women to intensively discipline themselves to attain a feminine ideal. Rather than being straightforwardly anti-feminist, then, post-feminism has an ambiguous relationship with feminism (McRobbie 2004). This suggests the relationship between neurosexism and feminism might be more ambivalent than it appears at first sight, too. This is especially apparent in the final chapter, which highlights how women’s health organizations promote the investigation of sex as a biological variable as the last frontier of the women’s rights movement. Here, brain organization research is firmly positioned as a feminist practice.

How, then, to respond? In this thesis, I have argued that the pervasiveness of neurosexism demands a critical alternative perspective that does not reject neurobiological knowledge but instead seeks to establish ‘neurological intimacy’ (Wilson 1998, 417). I have also argued that a material-discursive approach will provide the best framework for doing so. Such an approach accounts for the sociocultural practices in which differences materialize—including knowledge-making practices—but also for the (sexual) differences a body can make, without positing an underlying essence. In this account, plasticity refers to the inseparable entanglement of matter and meaning.

But can such a critical perspective be used to challenge neurobiological determinism without fostering norms, values and subjectivities that are antithetical to feminism? Can plasticity be considered an ethical metaphor and a right tool for feminism? At the outset of this study, I have stated that there is no definitive answer to this question. Concepts travel, and do different kinds of work in different contexts. Indeed, the plasticity of plasticity has asserted itself throughout this study: it may be used to challenge the ‘tale of two brains’ that represents
brain sex as dichotomous and hardwired, or it may precisely be incorporated by—and used as evidence for—this tale. It may invoke the generativity and resilience of the flesh, or it may suggest we have full ownership and control over the body. It may serve to draw attention to the historical and cultural embeddedness of bodies, or it may highlight individualism. It may be used to challenge naturalized norms and celebrate diversity, or it may be harnessed to identify individuals who are at risk of diverting from what is considered normal or healthy.

What does it mean, then, to (re)think the sexed/gendered subject as a neuroplastic subject? Again, there seems to be no conclusive answer, but by mapping the ontological, epistemological, and ethical considerations that this question provokes, this dissertation has (or so I hope) provided a rich description of the stakes that are involved.