The politics of plasticity: Sex and gender in the 21st century brain
Kleinherenbrink, A.V.

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Chapter three

Becoming a boy: brain sex in the classroom

‘If truth be told, one is not born, but becomes, a genius; and the feminine condition has, until now, rendered this becoming impossible.’
(De Beauvoir 2011 [1949], 152)

‘By virtually every measure, girls are thriving in school; it is boys who are the second sex.’
(Sommers 2000a)

Introduction

Since the 1990s, concerns have been rising across Western, industrialised nations about the state of men and boys (Epstein et al. 1998; Weaver-Hightower 2003). Countless magazine and newspaper articles, special websites, and blockbuster books with titles like The War on Men (Sommers 2000b), The End of Men (Rosin 2012), or The Demise of Guys (Zimbardo 2012) have raised the alarm about men rapidly becoming the disadvantaged sex. A major point of concern in this literature is the belief that boys are falling behind in school, earning lower grades than girls and dropping out more often before graduating (e.g. Gurian & Stevens 2005; Tyre 2006). This, in turn, has generated concerns about boys’ social adjustment: boys on the margins of the educational system are perceived as poorly adjusted and potentially dangerous. A Dutch teacher, for example, raised awareness about boys’ relative underachievement in school by drawing a direct link to terroristic ‘lone wolves’ like the ‘Unabomber’ Ted Kacynski and Anders Breivik (Haan 2011).

This crisis in boys’ schooling is generally attributed to a feminised educational system—in which feminine traits like verbal fluency or sitting still are preconditions for success and female teachers provide a feminine role model—geared towards a modern, post-industrial economy that values ‘brains over brawn’ (Covert 2014). Boys are no longer allowed to be boys, the argument goes, so they disengage and become insecure, awkward, and violent. To turn the tide, advocates argue for urgent educational reform.
We have been here before. At the turn of the twentieth century, the first feminist wave instigated similar concerns about the feminisation of boys and men. Feminism was blamed for creating a climate in which boys could no longer be boys. Experts called for educational reform to stop the feminisation of boys, and for the creation of homosocial spaces like the Boy Scouts (Kimmel 1996). The affirmation of traditional gender norms was backed up by biological theories of sex differences that ignored the potential impact of women’s social situation, including Galton’s claim that women’s smaller brains rendered them intellectually inferior (see Alaya 1977). Claims about sex differences in the brain are mobilised today as well to rationalise the boy crisis and to promote the rehabilitation of ‘natural’ masculinity. Best-selling boy advocates argue that boys and girls have different brains, which causes them to have different personalities, talents, and most of all needs (e.g. Gurian et al. 2010 [2001]; Sax 2008). They deem today’s educational systems ‘biologically disrespectful’, denying and disadvantaging male nature (Bruce Perry quoted in Tyre 2006).

Much has been written about whether or not boys are actually in crisis, about the construction of masculinity in these debates, and about the role of brain-based biological determinism involved (e.g. Gilbert & Gilbert 1998; Francis & Skelton 2005; Griffin 2000; Rivers & Barnett 2006; ‘Sweden’ 2010; Titus 2004; Weaver-Hightower 2008). Few have paid attention, however, to the way in which plasticity-based arguments interact with hardwiring arguments in neuro-inspired boy crisis literature. The deterministic claim that boys and girls have male and female brains is an easy target for critique. As I discussed in Chapter 1, the theory that men and women have different brains is highly controversial. The claim that young boys and girls have different brains has received even less empirical support (e.g., Eliot 2011, 2013; OECD 2002; Rivers & Barnett 2011; Halpern et al. 2011). Nevertheless, the idea continues to prove appealing to teachers, parents, and governments across the world.

I argue that analyses that focus purely on biological determinism do not fully appreciate the success of the message that ‘boys and girls learn differently’ (Gurian et al. 2010 [2001]). Attending to how hardwiring- and plasticity-based arguments interplay, I yield a more insightful understanding of how brain-based boy advocacy literature resonates with the current post-feminist, neoliberal climate. In this climate, introduced above, preoccupations with individual freedom, self-management, and optimisation coexist with a revival of sex essentialism, whereby fixed biological sex differences are represented as benign and useful (Gill 2007). I argue that the brain-based boy advocacy from authors like Michael Gurian and Leonard Sax succeeds because they thematise freedom and determinism simultaneously. They do so by framing sex differences in the brain as primarily sex differences in plasticity. In this
account, fixed biological sex differences appear, at least superficially, not as limitations but rather as a recipe for unlimited success and equality. Upon closer inspection, however, it is clear that this account is anything but empowering.

This chapter is structured as follows. After briefly reviewing the main factors that gave rise to the international boy-crisis discourse, I will discuss the interplay of plasticity- and hardwiring-based arguments in the work of Michael Gurian and other neuro-inspired boy advocates. I will pay specific attention to the notion of risk and to the significance of male socialisation, highlighting how this literature claims that ‘boys will be boys’ but that, at the same time, proper socialisation is crucial. Without it, boys become a danger to themselves and to others. I will use Basil Bernstein’s (1977) notion of implicit or invisible pedagogy to make sense of this perspective on ‘nurturing the nature’ of children. Finally, as an illustration of my analysis, I will recount how boy advocates’ brain-based claims have influenced the educational discourse in the Netherlands, with a particular interest to how assertions of natural sex differences have merged with a strong focus on individual differences.

The rise of the boy crisis

What incited the latest international panic about boys’ educational and social adjustment? At least three factors have contributed to the visibility and credibility of the current boy crisis.

Backlash against feminism

First, critics have interpreted the boy crisis as a backlash against the emancipation of women (Mills, Francis & Skelton 2009; Weaver-Hightower 2003). In the early 1990s, a number of books and reports drew attention to the dynamics of gender in educational settings, focusing on the adverse influence of gender stereotypes on girls’ education, self-esteem, and health (e.g. American Association of University Women 1992; Orenstein 1994). Subsequent studies, however, showed that differences in self-esteem were less dramatic than initially claimed (Kling et al. 1999; Major et al. 1999). In addition, critics argued that, while girls indeed lagged behind in science and maths, boys were worse off in school in all other respects (Kleinfeld 1998; Sommers 2000b). Sommers, for example, argued in her article ‘The War Against Boys’ (2000a) that feminist scholars who raised concerns about the effect of gender inequality on girls’ educational and social adjustment misrepresented their case. Boys, not girls, were the ones being short-changed by the educational system. Sommers asserted that the ‘manufactured
crisis of diminished girls’ promoted by ‘partisans of girls’ had some positive outcomes for girls, but that this effect was outweighed by the resulting ‘climate of disapproval’ of boys (2000a).

An international ‘moral panic’ about the failure of boys ensued (Smith 2003). The prime suspect of boys’ underachievement was the purported feminisation of our educational systems: boys were supposedly penalised for expressing their natural energy in a system that now demanded and rewarded traits for which girls supposedly excelled (e.g. sitting still and paying attention, emphasis on language). The disparity jeopardised their academic success as well as their general health and happiness. The most outspoken boy advocates, like Sommer, portrayed this situation as a battle of the sexes, with a direct trade-off between girls’ success and boys’ failure. This representation of the situation suggests that girls’ progress is unfair and undeserving (Weaver-Hightower 2003), which strengthens the case that the boy crisis is indeed, at least partly, a backlash against women’s emancipation.

The marketisation of education

The marketisation of education, which has been unfolding across industrialised nations for the past decades, has been a second catalyst of the current boy crisis. As cognitive labour became more vital to modern economies, national and international competition in scholastic performance became more important. Rankings of standardised test scores, such as the triennial Programme for International Student Assessment (PISA) reports published by the Organisation for Economic Co-Operation and Development (OECD), have been introduced to make this performance visible, comparable, and accountable. This quantification of scholastic performance calibrated educational systems for competition and optimisation, thus stimulating schools to function according to market-based principles.

It is in this context that the relative underachievement of boys has been observed and problematized (Ivinson 2014). In the UK, for example, anxieties about boys’ educational success followed in the wake of the introduction of national school league tables in the early 1990s. These tables were published for parents to make an informed choice about their children’s education, thereby stimulating competition amongst schools. As Ivinson has noted, this statistical approach to educational success served to make some (but not other) group differences visible and salient by providing group-based comparisons, including overviews of sex differences. Statistics in this regard have provided ammunition for boy advocates. This statistical approach towards boys’ and girls’ success quickly superseded qualitative analyses of how gender relations affect school experiences, to the effect of ‘reifying] representations of the learner’ (2014, 156). For Ivinson, the boy crisis is in truth an ‘epistemological crisis’, a
regression of gender theory, where masculinity is now once again understood as an unstoppable natural force that teachers must recognise and foster, rather than as a social phenomenon that they might question or redirect (164). Faced with school curricula valuing brains over brawn, in reflection of the recession of industries relying on physical labour in western nations, boy advocates are compelled to rework and reaffirm masculinity as a natural resource. Analyses of gender as a historical, sociocultural phenomenon have thus been traded for comparisons based on sex as a biological category.

Educational neuroscience

Since the turn of the century, increasing faith has been invested in the potential of brain science to innovate education. The emerging field of ‘educational neuroscience’, also known as the Mind, Brain and Education movement, aims to ‘to join biology, cognitive science, development, and education in order to create a sound grounding of education in research’ (Fischer 2009, 3). Central to this aim are understandings of plasticity, both in the sense of learning processes and of brain maturation. The underlying premise of educational neuroscience is that the neurosciences can revolutionise our understanding of how children learn, yielding innovative and highly effective teaching strategies. The ultimate goal of neuroeducators is to individualise education completely: ‘if every student were given a neurological evaluation, educators would have powerful clues as to the best way to personalize learning’ (Jensen quoted in Layton 2015). Despite concerns that such translations are ‘a bridge too far’ (Bruer 1997; De Vos 2015), the field has been positively bourgeoning. Alongside academic research, a large commercial industry of (purportedly) brain-based programmes and guides has flourished. Many of these popular resources are built around neuromyths, especially the myth that there is a range of ‘learning styles’ according to which students can be categorized (e.g. verbal versus visual processing, or left-brain versus right-brain dominance). The claim that learning is improved when teaching styles are matched to individual learning styles has been widely debunked (e.g. OECD 2002; Pashler, McDaniel, Rohrer & Bjork 2008), yet its influence on educational practices appears unabated.21

The belief that boys and girls have different learning styles can be seen as a specific version of this myth. It is widely promoted as the rationale for, and solution to, the boy crisis. International bestsellers like The Minds of Boys (Gurian & Stevens 2005) and Boys Adrift (Sax

21. A recent survey shows that in the UK, for example, 98% of teachers have encountered a learning-style based programme in their school, and 93% believe that such programmes would indeed improve learning (Dekker, Lee, Howard-Jones & Jolles 2012).
2007) all make a similar case: boys are born with different brains from girls, and therefore they have a different learning style. As such, they require different teaching strategies. In books like these, neuroscience is celebrated as the source of knowledge that trumps all other forms of knowledge. For example, Michael Gurian and Kathy Stevens write in *The Minds of Boys*:

> The social thinkers of the 1950s, 1960s, and 1970s did not have PET scans, MRIs, SPECT scans, and other biological research tools available to them. They had to make assumptions about how children learn without any real scientific evidence. … They had to overemphasize the power of nurture in gender studies because they didn’t have a way to study the actual nature of male and female. (2005, 42, my emphasis)

In the regressive move that Ivinson (2014) calls an epistemological crisis, a rich body of scholarship exploring the dynamics of gender in the classroom is nullified as misguided, pseudoscientific guesswork. Instead, neurobiology is introduced as the best and only lens through which to understand the dynamics of masculinity and femininity in the classroom (Busso & Pollack 2015).

One of the solutions offered by boy advocates to the purported boy crisis is to educate boys and girls with different methods, preferably in single-sex classrooms. Michael Gurian and Leonard Sax, both based in the US, are two of the most well-known and influential proponents of single-sex schooling. Gurian, who is not trained as a neuroscientist, has authored a range of books instructing parents and teachers about the different ways in which boys and girls learn (e.g. Gurian et al. 2010 [2001]; Gurian, Stevens & Daniels 2010). In addition, he applies brain sex theory to relationships and corporate settings (Gurian 2003; Gurian & Annis 2008). His books are translated into many languages, and he is a regular contributor to a range of high-profile media outlets. He co-founded the Gurian Institute, which offers training seminars, mediates funding for educators, sets up single-sex education pilots, and studies their efficacy. It boasts to have trained over 60,000 teachers from 2,500 schools (‘Success Stories’). Leonard Sax, who holds a PhD in psychology and an MD, has a similar profile. He has authored a number of books advising parents and teachers about boys’ and girls’ specific needs, using neuroscientific arguments as a rationale. He speaks and publishes on the subject internationally,
offers workshops for parents and teachers, and has co-founded an institute to promote single-
sex education, the National Association for Choice and Education (NACE).22

The arguments that these and similar advocates make for single-sex classrooms are
twofold. First, as I have made clear by now, there is the claim that boys and girls have different
brains and therefore need different pedagogic approaches. A second and related rationale is that
gender stereotypes in single-sex classrooms would play a smaller role than in co-ed classrooms.
Without the other sex present, boys and girls would not intimidate each other, and both boys
and girls would be less concerned with what others think of them. As the NACE website states:

Girls in single-sex educational settings are more likely to take classes in math, science,
and information technology, especially when teachers have received appropriate training.
Boys in single-gender classrooms—led (once again) by teachers with training in how to
lead such classrooms—are much more likely to pursue interests in art, music, drama, and
foreign languages. Both girls and boys have more freedom to explore their own interests
and abilities than in the coed classroom. (‘Introduction’)

The advocacy is paying off: single-sex education is on the rise in the US. According to NACE,
only about a dozen schools in the US offered single-sex education in 2002 when the
organisation was founded. In the same year, the No Child Left Behind Act called on the US
Department of Education to reconsider the prohibition of single-sex education under Title IX,
which regulates sex discrimination (Paige 2002). In 2006, this legislation was altered to allow
schools to set up single-sex classrooms (US Department of Education 2006). Between 2011 and
2012, over 500 schools in the US offered separate education for boys and girls (‘Single-Sex’).
In 2014, the number had risen to 850 (Anderson 2015). And the influence of Gurian and Sax
goes beyond US borders. Educators have implemented their views across the world. In the
Netherlands, as I will elaborate below, single-sex education is out of the question, yet Gurian’s
views on the education of boys and girls have been disseminated to teachers through a series of
state-financed publications.

This success is achieved in spite of numerous critiques. These critiques target a number
of aspects of the boy crisis literature. First, critics have argued that boys are not in crisis at all,
and that the rhetoric of boy-crisis advocates merely serves to naturalise and reaffirm male

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22. The organisation was originally called the National Association for the Advancement of Single Sex
Public Education (NAASPE), a name ‘deliberately patterned after the National Association for the Advancement
of Colored People (NAACP)’ (see http://www.4schoolchoice.org/).
privilege (e.g. Barnett & Rivers 2006; Mills 2003; Williams 2011). Second, as I have already mentioned, there is little support for the claim that boys’ and girls’ brain are so different as to warrant different educational approaches. As Eliot phrases it in a recent review, ‘the only evidence that “boys and girls learn differently” boils down to a tautology: they perform differently in school, therefore, they must learn differently’ (2013, 375). In addition, the evidence that children perform better in single-sex classrooms is very mixed, showing no definite support for the claim (Bigler & Signorella 2011; Pahlke, Hyde & Allison 2014). If anything, gender-stereotypical behaviour seems to increase rather than decrease in single-sex settings (discussed in Halpern et al. 2011). Instead, boys and girls equally benefit from other, shared interventions like smaller classrooms, more competent teachers, and increased funding (Martin 2007). Finally, critiques have addressed how social categories that intersect with sex/gender, particularly social class and race/ethnicity, are treated in the boy-crisis literature (e.g. Gillborn & Gibbs 1996; Griffin 2000; Kimmel 2010; McCready 2012). Many have commented on how boy advocacy tends to marginalise these categories by focusing on sex/gender differences, and have emphasised the importance of clarifying the question ‘which boys?’. The notion of brain sex is instrumental to this homogenisation of boys: as I have argued in detail in the previous chapter, it obscures within-group variation and between-group overlap, making sex differences seem dichotomous. And, it would follow, if all boys have a male brain, then they all have the same problems. As Kimmel (2010) has argued, differences among boys—by race, or class, for example—do not typically fall within the radar of the cultural critics who would rescue boys. These differences are incidental because, in their eyes, all boys are the same. A crude biologism pervades much of the dire warnings about the fate of boys in school, one that flattens all differences among boys, and exaggerates the differences between boys and girl. (26)

At the same time however, single-sex schooling is often presented as a means to improve the educational experiences of low-income boys and ethnic minority boys in particular. This is a longstanding and controversial idea. Whereas some have claimed that segregated classrooms can indeed function as a critical ‘counterspace’ (Terry et al. 2013), others have argued that single-sex schooling policies do not succeed in tackling poverty and racism, and reinforce not only gender stereotypes but also racialised stereotypes like that of the hypersexual black male (see Williams 2004; Goodkind 2013):
In the urban setting, single-sex education tempts school administrators to focus on the interests of black boys to the detriment of black girls. It repeats in racialized form the familiar idea that girls are the cause of boys’ lack of educational success and that boys must be kept free of distraction. (Balkin 2002, 10)

Together, these critiques suggest that the real crisis we have been facing since the beginning of this century is the reaffirmation of sex essentialism in the service of foreclosing any critical interrogation of hegemonic masculinity and its intersection with other social categories. In popular culture and in politics, the wealth of academic work engaging with the dynamics of masculinities in relation to race/ethnicity, sexuality, queerness, and other perspectives is drowned out by the loud voices of ‘backlash blockbusters’ (Mills 2003).

Although I rehearse key aspects, I am not specifically interested in the truth value of the claims made by Gurian, Sax, and other neuro-inspired boy advocates in this chapter, nor in offering alternative accounts of boys’ experiences in the classroom (many others have already done so). Instead, I am interested in how these authors mobilise (pseudo-)neuroscientific arguments to rationalise the boy crisis, to cater to the anxieties about the state of masculinity by reaffirming natural sex differences, and to appeal to notions of individuality and freedom—all the same time.

‘Boys and girls learn differently’

‘Thirty years of politically correct insistence that gender doesn’t matter has had the ironic and unintended effect of reinforcing gender stereotypes’, Sax claims (2008). His goal is to achieve gender equality: equal chances for boys and girls to achieve their full potential. Importantly, Sax stresses, this potential is the same for boys and girls; only the means through which it can be realised is different. ‘There are no differences in what girls and boys can learn’, the NACE website insists, ‘But there are big differences in the best way to teach them’ (‘Learning Style’). Likewise, Gurian states that, ‘It is not the differences between male and female but rather disrespect for the natural strengths of each gender that is a root cause of oppression’ (2007, 124). He, too, professes that gender equity can be achieved if we understand natural sex differences and adapt our education accordingly: ‘both [male and female] brains can get better at all intelligences with proper stimulation’ (Gurian et al. 2010 [2001], 52). When differences in cognitive skills like abstract cognition and language are discussed, they are mainly approached in terms of learning styles rather than in terms of aptitude. Both Sax and
Gurian, for example, maintain that the gender gap in maths skills can be minimised if girls are taught maths in a concrete manner (using real objects to manipulate or using stories), whereas boys do best learning maths from the blackboard. Similarly, they argue boys can become more apt at reading and writing when lessons involve sensory stimulation and acting out stories (Gurian & Stevens 2005, 152-154) and when ‘boy friendly’ questions are asked (‘what would you do?’ instead of ‘how would you feel?’) (Sax 2007, 41-42).

In the framework provided by Sax and Gurian, allusions to gender equality and equal potential are thus combined with an emphasis on the immutability of biological sex differences in the brain. Gurian, for example, states his position as follows:

*the gender of the human brain is not plastic … It is as hard-wired into the brain as a person’s genetic personality. … Our educational system has bought into the idea of “overall neural plasticity.” Because of this mythical concept of the brain as a magical, changing device, very few academic institutions train teachers in the neural sciences of gender.*

(Gurian & Stevens 2005, 60)

As this statement indicates, Gurian resolutely rejects the possibility that sex differences in the brain are plastic. However, he and Sax also mobilise plasticity to their advantage by portraying sex differences in the brain as differences in learning style (as *sex differences in plasticity*). In this account, brain sex is not so much about *form* or ways of *being*, but much rather about *process* or ways of *becoming*. The sky is the limit for both boys and girls, yet the way in which they should reach for this limit differs. So, above all, male and female brains are represented here as two different ways of becoming a unique individual.

This particular understanding of brain sex allows boy advocates to move in two directions at once. On the one hand, it modernises neurosexism by emphasising that gender roles are flexible and that children can do and be anything they want to. On the other hand, it remains conservative by emphasising that masculinity is natural and that boys will therefore always be boys. As such, it fits very well in the contemporary climate of neoliberal post-feminism, as I have discussed it in the general introduction. In this climate, or in Gill’s (2007) term ‘sensibility’, themes of freedom, choice, and optimisation are merged quite effortlessly with claims of fixed biological sex differences. On the one hand, a clear natural order is postulated, but on the other, men and women are represented as free and flexible agents within this order. In a world where everything can be turned into a resource, their natural traits are no longer restrictions but rather useful and pleasurable truths about the self that can be used to their
benefit. Similarly, in the work of Gurian, Sax, and other boy advocates, brain differences become a recipe for personal optimisation; follow it, and a child can become whatever it wants.

A central part of this argument is the ‘maturity gap’: ‘one of the most pronounced brain-based gaps males and females ever experience’ and ‘one of the most profoundly disabling features of contemporary classroom life’ (Gurian et al. 2010 [2001], 62). Because girls’ brains mature at a faster rate, Gurian argues, boys appear defective by contrast. Compared to girls of the same age, boys have less emotional control, take more risks, and get into trouble more often. However, given enough time, boys will end up where girls are. Again, the central idea is that boys and girls have unlimited future potential, but their trajectories are different. Indeed, sex differences in the rate of brain maturation are rather well established, especially during puberty. The brain’s developmental trajectory around this age follows an inverted U shape, the peak of which appears to occur, on average, a few years earlier in females (e.g. Lenroot et al. 2007). The significance of this sex difference in terms of behaviour, however, is still poorly understood (Giedd et al. 2012). A ‘dual systems model’ of the teenage brain has been proposed which posits that brain areas associated with the processing of socioemotional rewards mature at a faster rate than areas associated with cognitive control, resulting in impulsive and risky behaviour (Steinberg 2010).

Even though the ‘adolescent brain’ has become a major item of interest over the past decade, theories linking brain maturation to behavioural impulsivity and instability in teens have been criticised for exaggerating adolescents’ propensity for risky behaviour, for treating adolescents’ brains as disembodied entities, and for ignoring alternative predictors of risky behaviour like poverty (e.g. Bessant 2008, 2012; Kelly 2012; Koffman 2015; Males 2009; Sercombe 2014). Gumy (2014) has addressed claims about sex differences in teenage brain discourses, noting that in this area of research, ‘[t]he category of sex tends to obscure, even absorb that of gender, hence causes a reduction of the social complexity at the individual level’ (268). When we want to understand the experiences of children in education or in other contexts, it is crucial to attend to this social complexity. This does not mean that the brain should not have a place in explanations of differences between boys and girls, but it does mean that our understanding of children’s brain development has to become more complex and more contextualised. For example, we might ask to what extent the sex difference in brain maturation is contingent on certain aspects of the developmental environment. As it is now, brain maturation during adolescence is typically regarded as a more or less autonomous process, unaffected by experience. The implication of this is that any sex difference in brain maturation would be pre-programmed at birth.
As I have argued in the previous chapter, when investigating the influence of social factors on sex differences in the brain, it is important not to take these brain differences or differences in experience for granted. Mapping gendered experiences onto the brain risks essentialism when these experiences are conceptualised as two distinct, homogenous patterns shared by all girls and all boys. In reality, the experience of being a girl or being a boy is highly variable and co-dependent on other aspects of one’s embodied identity. In The Brain’s Body, Pitts-Taylor (2016) also draws attention to this issue:

Efforts to depict brains as biosocial also rely on [an] effort to fix persons in social categories, statistical aggregates, or populations that can be mapped onto the brain. The resultant neural phenotypes may resist biological determinism, but they do not automatically resolve the attendant problems of reification and essentialism. The measurement of human difference through biosocial plasticity can require cuts that belie biosocial complexity and that (mis)construe the experience of individuals and groups as homogenous and predictable. (41)

She demonstrates this problem with an analysis of studies mapping the effects of poverty onto children’s brains. In this research programme, she argues, ‘the plastic, biosocial brain gains a class phenotype through biosocial reductionism’ (124) while questions of generalisations across individuals and across contexts are ignored. One of the most troubling consequences of this, she writes, is that these representations of poverty as a neural phenotype justify strategies of pre-emptive governance addressing ‘social problems that are entangled with race, gender, and class inequalities’ (39). This is also visible in the context of single-sex schooling. As I have discussed above, whereas brain-based arguments for single-sex schooling often essentialise masculinity, actual policies will often target poor and minority boys and thereby risk reifying and essentialising stereotypes at the intersection of gender, class, and ethnicity.

The following chapters will further highlight how plasticity-based research approaches participate in the construction of certain groups as at-risk and risky, and as appropriate targets of intervention. Now, however, I want to return to the brain-based boy advocacy literature and address the specific role of socialisation in this body of work.
Boys becoming boys

Interestingly, male socialisation—for and by men—does take centre stage in the work of Gurian and similar authors, but in a radically depoliticised and naturalised way. They represent brain sex as simultaneously immutable—something boys (and girls) simply have—and highly precarious. For these authors, boyhood does not morph safely into manhood without proper guidance and role modelling. Their nature must be properly nurtured: ‘To become a man, a boy must see a man’ (Sax 2007, 204). If socialisation fails, everyone is in trouble. With their slower rate of maturation and natural impulsivity, boys are considered both fragile and dangerous. ‘Boys are always at the edge of causing harm to themselves or others because they’re such physical risk-takers,’ says Gurian (1996); ‘If we don’t respect male hormones and brains … they will cause harm to themselves and others’. Likewise, Steven Biddulph, another boy advocate, writes that ‘being young and male is a condition so vulnerable, so prone to disaster’ (2010 [1998], 1). So, socialisation is understood as a crucial factor in boys’ lives, but what that socialisation should look like is fully circumscribed by his nature.

Gurian stresses that his thinking does not oppose nature against nurture and does not amount to determinism, because his views of human nature do not limit behaviour. He uses crying as an example: one can teach boys not to cry, although that will not change their brains (Gurian & Annis 2008, 14-15). Yet, his whole argument revolves around the idea that nature must ultimately trump nurture. The main point of the campaign for boys is, after all, that any attempt to transcend male nature is harmful to boys and to society at large. Instead, male nature has to be recognised, respected, and fostered. Any decision not to let nature ‘run its course’ would be a dangerous ideological choice. ‘Armed with [brain] scans, [we] can press our educational culture to change not the boys but rather the myth of gender plasticity under which we labor against our sons’ natural energy and learning style’, Gurian (Gurian and Stevens 2005, 56) writes, calling upon society to ‘put to rest the idea that humans can, should, or need to reengineer the brain into whatever our recent educational institutions or ideologies want it to be’ (Ibid.). It is up to parents and teachers to recognise male nature and to nurture it to maturity, aided by the knowledge of neuroscientific experts.

As Williams (2012) has noted, it is quite striking that boy advocates mobilise essentialist notions of male nature, since women are the ones who have historically been associated with nature and with the limits imposed by their bodies. Indeed, these advocates go to lengths to emphasise that neurologically speaking, boys are the fragile sex. Gurian (Gurian and Stevens 2005), for example, likens the male brain to ‘porcelain’ and the female brain to ‘steel’, arguing
that the male brain is relatively unstable and therefore more likely to be labelled ‘learning disordered’ (218). Biddulph, citing statistics of deaths, accidents, and suicides, writes that when it comes to their health, ‘boys are like a developing country’ (2010 [1998], 3). However, Williams (2012) writes, this reversal does not mean that boys have truly become the second sex. Instead, she argues, by preventing critical interrogation of male socialisation and naturalising hegemonic masculinity, this move reinforces male privilege (546). Indeed, in the boy-advocacy rhetoric, male fragility is asserted in order to get parents, teachers and doctors to rally around boys to reaffirm and protect their supposedly inherent masculinity, while girls are suggested to be fine on their own, thanks to their robust brains.

Williams (2012) argues in her analysis that in the work of Gurian, girls in particular are represented as capable of becoming anything, thanks to their superior biology, whereas boys are represented as more limited by their biological characteristics. I agree that this focus is indeed apparent in Gurian’s work and similar literature. Yet at the same time, Gurian and others repeatedly emphasise that boys can become anything, they just need a different approach. As such, they straddle two apparently contradicting opinions: on the surface, they reaffirm traditional masculine traits and oppose the feminisation of boys, yet on a more subtle level, they also argue that boys can and probably should acquire traditionally feminine traits provided that these are learned in a masculine way. This uneasy combination of reaffirming and reinventing masculinity is precisely what, in my view, makes this genre so effective and appealing to parents and educators who are concerned about the future of boys, since it offers resistance against social and economic changes while implying, on a more implicit level, that boys do stand a chance in an economy that values brains over brawn, if only parents and educators prepare them with appropriate methods.

**Nurturing nature: Gurian’s invisible pedagogy**

Gurian’s mobilisation of neuroscience combines stark determinism with explicit appeals to freedom. In his books, the brain is the seat of a child’s immutable ‘core nature’ as well as the source of flexibility, potential, choice, and risk. As Thornton (2011a) has noted, this combination is a hallmark of contemporary neuroculture: ‘Determinism and optimization are not mutually exclusive positions in popular neuroscience; rather, determinism is the flip side of optimization, and both play important roles in brain culture’ (51). Indeed, she argues, popular neuroscience owes its ‘rhetorical power’ precisely to this combination of the brain as both cause
and consequence of our actions (57). If the brain were not viewed as the seat of our identity, changing and protecting it would not be of such crucial importance (61-62).

In Gurian’s writings, children’s male (or female) nature is always a given and in need of protection and sustenance.Parents and teachers are tasked with recognising this unique ‘core nature’ of a child and facilitating the unfolding of her or his hardwired personality. On the one hand, Gurian represents this unfolding as a more or less autonomous process. For example, in *Nurture the Nature*, he describes the synaptic activation and pruning in new-borns as wilful acts of a baby’s core nature: ‘our children’s brains make the choices they need to make, according to their own nature’ (2007, 88). On the other hand, he emphasises the work required of caregivers to guide this process:

Your child is not a blank slate—his or her brain cells for temperament and personality, for instance, are already in place; his or her genetic legacy and inherited potential are already in existence—but it’s by your hugging, holding, and talking to this child and caring for this child that you’ll be helping him or her activate this personality, legacy, and potential. (87-88)

In lieu of Gurian’s assertion that this knowledge is ‘liberating’ for parents (88), his views on pedagogy require an intensive parenting style. Intensive parenting has been identified by cultural scholars as an ideology that developed in the second half of the twentieth century, as parenting became increasingly focused and time-consuming, especially for mothers (e.g. Furedi 2001; Hays 1996; Nelson 2010). The focal point of this ideology is not obedience, but the child’s needs: ‘The logic of intensive parenting requires that parents interact with their child at virtually all waking moments, attending closely to the child’s needs and demands’ (Quirke 2006, 389). Even though this ideal of motherhood addresses women in general, it requires resources that many mothers cannot afford (Hays 1996; Fox 2001). As such, mothers who can afford to spend all their time and energy on their children may have more successful children not because intensive parenting pays off, but simply because they are already privileged in terms of social class/socioeconomic status. From the 1990s onward, brain-based parenting advice further intensified this ideology by framing early brain development as a critical period in which both risk and opportunity are enormous, and insisting on constant emotional and cognitive stimulation as a requirement for optimal developmental outcomes (Nadesan 2002; Wall 2004, 2010).
Gurian’s work reflects this ideology perfectly. He advises parents to closely monitor their child for signs of her or his ‘core nature’, and to use the expert knowledge he offers to interpret these signs and choose the right course of action. He urges them to ‘constantly [look] in their [child’s] eyes and [say], “What does this girl need? What does this boy need?”’ (2007, 94). Developmental steps are to be taken only if the child seems ready (128), recalling that parents have to keep in mind that girls develop faster than boys. At the same time, parents are warned not to hover or to show anxiety: the child must not experience any pressure to be anything other than his or her unique self (131). The intensive monitoring that this ‘tailored care, from the inside out’ (5) requires must thus be as unobtrusive as possible.

In his study of British nursery schools from the 1960s onwards, sociologist Basil Bernstein (1977) has elaborated on this ideal of nurturing children’s unique natures by way of intense but unobtrusive surveillance, which he terms implicit or invisible pedagogy. His main interest was in how pedagogic practices relay power relations, with specific attention to class inequalities. Tracing the emergence of a new middle class, characterised by the production and control of services and communications, Bernstein identified a shift from visible to invisible pedagogy. The former, associated with the old middle class that produces and controls goods, constitutes an explicit and overtly hierarchical relationship between the child and the teacher or parent. The latter is much more implicit and progressive, emphasising self-regulation and competence, and encouraging children’s diversity. Both the old and the new middle class believe that a child’s nature is fixed, but the new middle class ‘also hold that the type is capable of great variety’, allowing for ‘ambiguous personal identity and flexible role performances’ (113). In other words, the new middle class holds ‘a theory which points towards social mobility—toward a meritocracy’ (113).

The meritocratic ideology is embodied by invisible pedagogy, which operates on the principle that ‘implicit nurture reveals unique nature’ (1977, 111). Importantly, even though this invisible pedagogy appears to offer the child more freedom of self-determination, it actually involves much more complex and far-reaching control mechanisms: it ‘encourages more of the socialised to become visible, his uniqueness to be made manifest. Such socialization is deeply penetrating, more total as the surveillance becomes more invisible’ (113). In this ‘contradictory exercise’, Roger Cox (2002) writes in *Shaping Childhood*, ‘The child (unknowingly) and the professional (with expert knowledge of the child’s innate propensities) enter into a complex, apparently non-hierarchical, non-evaluative relationship which steers the child towards its own unique destiny’ (191).
Although the usefulness of Bernstein’s work for feminist scholarship has been contested (Arnot 2002), I find his elaboration of invisible pedagogy highly illuminating in relation to Gurian’s writings, which read like a manual in this ‘contradictory exercise’. He assures parents and teachers that children’s nature will shine through no matter what they do, yet at the same time he threatens that this nature will be deformed if not properly nurtured. Parents and teachers are strictly forbidden to interfere with a child’s inner self, yet they are required to engage with intensive monitoring and control in order to create the right setting or this self to unfold. The brain, in its dual role of source and receptacle, functions as a grounding device for these contradictions. As the seat of a child’s unique nature and the locus of risk and potential, the brain as Gurian represents it rationalises the logic of his invisible pedagogy and provides the tools for caregivers to carry out its imperative. Gurian offers up his expert knowledge about sex differences as a crucial tool to do so.23

Interestingly, whereas Gurian offers up his version of an invisible pedagogy as a solution to the boy crisis, Bernstein linked invisible pedagogy, with its weak classifications, precisely to girls’ success relative to boys: ‘girls are less likely to be negatively constrained by invisible pedagogies than visible pedagogies. Conversely, for boys, under an invisible pedagogy practice, girls become successful competitors and a threat’ (1990, 82). However, as Arnot has argued, the emancipatory effect of invisible pedagogy should not be overestimated: whereas its ideology granted mothers and female teachers unprecedented control over the transmission of symbolic property, she notes, these women had little to no influence over the content of the transmission for which they were now held responsible, as gender relations within the family and within the pedagogic profession remained unchanged. Working-class mothers and their children in particular were unable to profit. As Bernstein himself observed, the logic of invisible pedagogy is based on class-specific assumptions as the space, time, and effort involved are not available in all homes. As such, children from disadvantaged households will not be a good ‘fit’ in an educational system operating according to an invisible pedagogy. Similarly, even though Gurian claims that his books will help all boys and girls, the demands he imposes on parents are far from democratising, since not all parents can afford to spend all their time gazing into their child’s eyes to catch a glimpse of her or his soul. In this respect, Gurian risks further amplifying, rather than ameliorating, inequalities in education.

23. Gurian’s occasional remark that even though sex differences are significant, there are exceptions to the rule (e.g. ‘bridge brains’, which are in between male and female brains), only seems to heighten fears of imposing the wrong kind of socialisation, further necessitating detailed expert knowledge about how to recognise and regulate children’s nature.
Reaching for excellence: Gurian in the Netherlands

In the final section of this chapter, I want to supplement my analysis of brain-based boy advocacy with a description of the Dutch context. In the Netherlands, concerns with international competition in scholastic achievement contributed to the visibility and salience of sex differences in educational success as it did in other countries, yet policies initially focused on optimising the potential of the individual student. While concerns over the boy crisis were mounting in other countries, Dutch policy considered differentiating between boys and girls as unnecessary or even counterproductive to the establishment of an ambitious learning culture. At the same time, however, a series of state-financed publications disseminated the ideas of Gurian and other neuro-inspired boy advocates to teachers. Over time, this brain-based perspective allowed the concern with the individual, unique student to merge with a focus on sex differences.

In the Netherlands, sex-segregated education was formally ended with the ‘Mammoth Act’ reform of 1968. This law was intended to make secondary education more meritocratic, increasing social mobility. During the 1970s and 1980s, campaigns were launched with the aim of increasing girls’ educational participation. Girls made great strides: in 2006, a report commissioned by the Dutch Ministry of Education, Culture, and Science (OCW, ‘onderwijs, cultuur en wetenschap’) showed that girls, as a group, had surpassed boys in terms of attaining ‘successful school careers’ (Van Langen & Driessen 2006). The focus of the report was mainly on non-cognitive skills, in which girls showed the most advantage. At the same time, girls still lagged behind in maths and science and they were still vastly underrepresented in technical areas in tertiary education. However, following international developments, the media picked up on the disadvantages of boys, concerned that Dutch boys might also be in crisis (e.g. NRC 2008; Obbink 2009).

In the wake of these first rumblings, concerns were also raised about maintaining the excellent position of Dutch students in international rankings. The PISA rankings of 2010 showed that even though Dutch students performed very well compared to other OECD countries (OECD 2010), their achievements threatened to stagnate. In response, the OCW presented a plan to make both primary and secondary education more ambitious and more results-oriented. Two action plans were developed, ‘Basis voor Presteren’ (‘Basis for Achieving’, Netherlands 2011a) and ‘Beter Presteren’ (‘Achieving More’, Netherlands 2011b), calling for an explicit refocus on excellent students rather than weak ones. ‘Given the Dutch ambitions for economic growth and social development,’ one of the reports warned, ‘we cannot
afford’ the fact that other countries might surpass the Dutch students’ (Netherlands 2001b, 1; my translation). One of the interventions was to obligle schools to use the existing leerlingvolgssysteem (‘student tracking system’), which makes the school career of Dutch students easy to assess and compare. Dutch educational policy re-emphasised making use of each individual talent and on passend onderwijs/maatwerk (‘custom tailoring’) education. Since 2014, schools even have a ‘duty of care’ for each individual student, requiring them to provide an optimal environment for each individual child, focusing not on learning disabilities but on the possibilities of each single student.

In the following years, several reports confirm the finding that Dutch girls perform better than boys in terms of non-cognitive skills and successful school careers, even though they are still behind in maths and science (Driessen & Van Langen 2010; Netherlands 2011d). The president of the Governing Council of Christian Schools argues for sex-segregated education in a national newspaper, but his suggestion appears to fall on deaf ears (Petovic 2011). The sector organisation for primary education responds that custom tailored education, focused on the individual student, should be preferred instead (ANP 2011). That same year, the minister of OCW states in a letter to the State that there is no reason for concern about Dutch boys, that she has no intentions of developing boy-specific policies, and that she expects boys to profit from the general interventions of the action plans for increased achievement (Netherlands 2011c).

Meanwhile, an OCW-financed teacher guide, entitled ‘HijZijWijzer’ (‘HeSheGuide’), relies heavily on popular boy crisis literature, and instructs teachers that boys and girls have different genes, hormones, and brains (Janssen, Evers & Voskens 2010). Insight in these biological differences, the guide claims, is ‘a prerequisite to meeting boys’ and girls’ individual needs’ (9; my translation). It provides a long list of examples: girls are more focused on contact than boys (13); boys are specialists, whereas girls are generalists (20); girls are sensitive and empathetic whereas boys are aggressive and competitive (27); and so on. All these differences are linked to purportedly innate brain differences (e.g. more lateralisation in girls’ brains). Teachers are given some tips on how to handle boys and girls in the classroom; for example, boys need help with self-reflective whereas girls need help with being assertive (52-53). The report does not mention the fact that these claims are highly controversial.

The OCW have commissioned two additional reports on what constitutes successful education for boys, resulting in another guide for teachers (handreiking), accessible online.24

24. The guide may be found at http://handreikingjongensmeisjes.slo.nl/.
The first report contains a large section on typical boy characteristics (Maréchal-van Dijken et al. 2012). Like the ‘HijZijWijzer’, it relies heavily on popular literature like Gurian’s, supplemented by teachers’ anecdotes. ‘I see the traditional role pattern’, one teacher observes (20; my translation). The only explanation for this pattern offered in the report is brain sex theory, without a critical note. The rest of the report lists ‘best practices’ of successful teachers, all intended to facilitate boys’ natural differences. The second report is much more nuanced (Heemskerk et al. 2012). It observes two different approaches to the boy problem: a ‘nature’ approach and a ‘nurture’ approach. The authors do not take an explicit position, and note that schools do not do so, either. Approaching the problem pragmatically, the report observes, schools do notice gender differences, but try to relate to children as individuals. Most successful schools, therefore, have no specific approach for boys.

The OCW’s second guide, which is an online site, summarises the two reports in the following ‘vision on dealing with differences’, which is worth quoting at length:

A clear view on the differences between boys and girls helps to meet the pedagogic and didactic needs of students. This does not entail a specific approach for boys. This would lead to undesirable limitations and stereotyping, and ignores the fact that variation within groups of boys and girls is large. However, insight in sex differences can contribute to a better handling of differences. Schools where boys perform relatively well, have no policies targeting boys specifically … What these schools do have, is ample attention for dealing with differences and room for an individual approach to students, which includes sex differences as a self-evident focus. Differences between boys and girls are noted, but dealt with on an individual level. … A teacher who is good for boys is also good for girls. ('Visie op omgaan met verschillen’, my translation)

It is interesting to see how this advice veers from stressing sex differences to warning against stereotyping; foregrounding sexual difference and individual variation at the same time. The text thereby expresses both the desire to recognize the child’s unique core nature by using expert knowledge about brain sex, as well as the fear of imposing the wrong pre-conceived ideal on her or his unfolding self. Despite an initial opposition between an individual-based approach and a sex-based approach in the Dutch debate, the belief that boys and girls have different educational needs now resonates quite effortlessly with the focus on individual differences and

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25. In the guide, teacher success was determined by male pupils’ ratings, and not their actual achievements.
custom tailored education: ‘The teacher is seen as responsible for an individual learner’s needs, embodied in their *gendered* brains’ (Titus 2004, 157; my emphasis). As I argued above, this relationship between sexual difference and individual variation is successfully grounded by the brain, which serves as the nexus of both determinism and optimisation.

In 2013, the new minister of the OCW presented the new Cabinet’s outline of emancipation policy, putting the boy crisis squarely on the political agenda with a new focus area, entitled ‘Girl Success or Boy Problem’ (Netherlands 2013). This resulted in a new report: ‘De jongens tegen de meisjes’ (‘The boys against the girls’, ROA 2015), focused mainly on secondary education. Unlike what the title suggests, this report is quite nuanced. When it discusses brain differences as an important rationale for disparities between boys and girls in education, it acknowledges the impact of the environment on sex differences in the brain quite explicitly, unlike the other reports discussed in this section:

> A warning about the nature of neuroscientific explanations for cognitive differences between boys and girls is in order. … [I]f boys and girls use different brain areas for a similar cognitive performance, that could be the result of a different development and not the cause. It is therefore of crucial importance to take into account previous experiences when discussing boy-girl differences. After all, it is the environment that determines to a large extent the changes in the microstructure of the brain which in turn determine further cognitive development. (Jolles & Keizer 2015, 43; my translation, references removed)

The above represents a hopeful development, opening the door to a more complex and adequate understanding of how and when sex matters in the brain by adding ‘the plasticity of sex differences’ to the vocabulary of boy-crisis advocacy. Hopefully, future developments in the field will also pay attention to the heterogeneity and intersectionality of gendered (and other) experiences.

**Conclusion**

In this chapter, I have engaged with brain-based boy advocacy literature, focusing on the work of Michael Gurian. In my analysis, I have addressed the interplay of hardwiring- and plasticity-based arguments in these texts. This focus enabled me to highlight the way in which some authors thematise determinism and freedom at the same time. I suggest, here, that brain-based arguments for single-sex education cannot be fully addressed by a critique of biological
determinism. Rather, my discussion suggests that the success of these arguments lies in the combination of biological determinism with an explicit appeal to unlimited brain potential. By looking at the conceptualisation of brain sex in the work of Gurian and similar authors as a conceptualisation of _sex differences in plasticity_, I have highlighted the fact that brain sex as a natural, fixed property is not understood here as limiting the possibilities of boys and girls but precisely as a resource or recipe for individual optimisation. With this combination of biologically determined sex differences and limitless potential, these texts speak to a neoliberal, post-feminist sensibility (Gill 2007).

By focusing on differences in learning style and maturation rates rather than on differences in aptitude per se, authors like Gurian affirm a natural order in which masculinity and femininity are eternal, homogenous and complementary, whilst accounting for recent shifts in gender roles. As such, they use a strategy similar to evolutionary psychologists, who argue that their claims are not biologically deterministic because they do not see behavioural output as fully determined by our evolved psychology but as contingent on environmental input (e.g. Confer et al. 2010). Of course, this evolved psychology itself _is_ viewed as genetically determined. Likewise, in texts examined in this chapter, plasticity is conceptualised as intrinsic processes of learning and maturation which are themselves fixed and immutable. As such, sex differences in plasticity appear as hardwired. I have argued that a full account of boys’ and girls’ experiences in the classroom has to take into account the plasticity of sex differences. In other words, _if_ boys and girls have different learning styles and/or brain maturation rates, then the question arises to which extent these differences are contingent on the developmental environment. However, I have also cautioned against projecting gender differences onto the brain without attending to their heterogeneous and intersectional nature.

The texts that I have discussed in this chapter highlight the potential of boys as well as their fragility and dangerousness. Even though their natural masculinity is taken as a given, they are represented as needing intensive socialisation in order to reduce the risk they pose (for themselves and for others) and to optimise their development. This requires intensive yet invisible parenting, an ideology which is tightly bound up with class. In the next chapter, which focuses on the parental brain, I will address in more detail the expectations placed on parents by popular neurodiscourses that figure particular brains as at-risk and _a_ risk.