‘MY BRAIN WILL BE YOUR OCCULT CONVOLUTIONS’: TOWARD A CRITICAL THEORY OF THE BIOLOGICAL BODY

by

CLIFFORD HENRY VAN OMMEN

submitted in accordance with the requirements for the degree of

DOCTOR OF LITERATURE AND PHILOSOPHY

in the subject of

PSYCHOLOGY

at the

UNIVERSITY OF SOUTH AFRICA

PROMOTER: PROF VASI VAN DEVENTER

NOVEMBER 2009

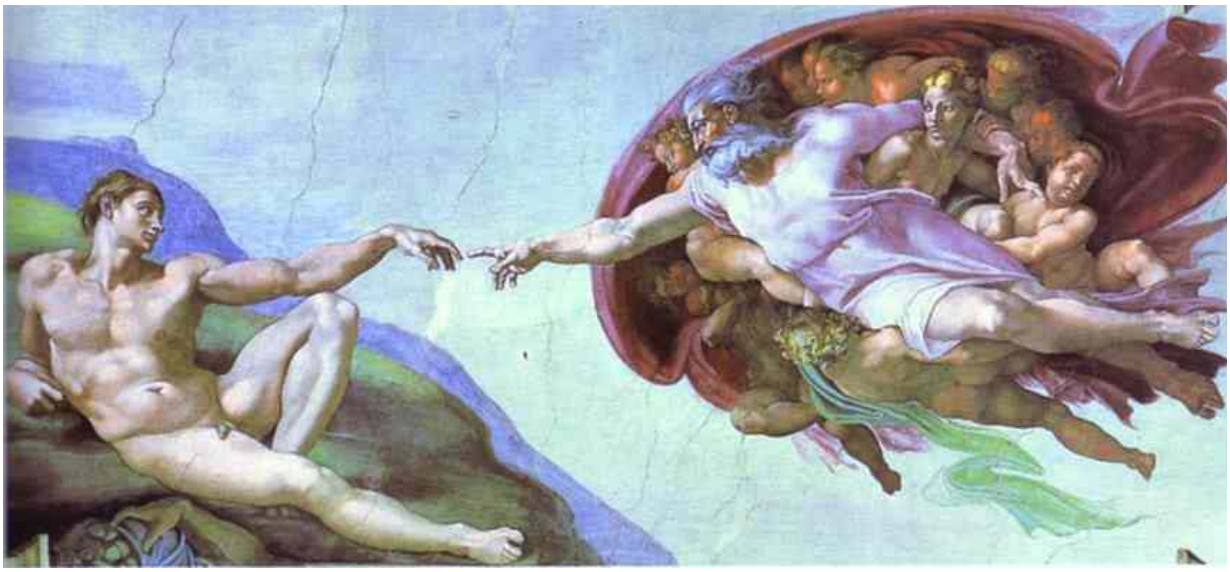
DECLARATION

I declare that *'My brain will be your occult convolutions': Toward a critical theory of the biological body* is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

For Julian

You shot through my anger and rage
To show me my prison was an open cage
There were no keys, no guards
Just one frightened man and some old shadows for bars

From *Living Proof* by Bruce Springsteen



The creation of Adam by Michelangelo

ACKNOWLEDGEMENTS

I would like to acknowledge the contributions of the following individuals and institutions:

- My supervisor, Vasi van Deventer, for his endless positivity and unspoken faith in my ability to find a way.

- My comrades, colleagues and friends, Werner Böhmke, Desmond Painter, and Jeffery Yen, for their intellectual, moral and emotional support through the darkness.

- Rhodes University, for granting me periods of academic leave, as well as for awarding me a Mellon Humanities and Social Science Development Grant which allowed me the space to complete this project.

- The National Research Foundation (NRF) for awarding me a HICD-Thuthuka Grant which assisted me in finishing this doctorate.

- Foremost, Michelle, for her support, compassion, patience, mercy and sacrifice – all the things that love enables.

The phrase ‘My brain will be your occult convolutions’ used in the title of this doctorate is taken from Walt Whitman’s poem *Song of Myself*.

CONTENTS

SUMMARY

This project forms part of a growing engagement with biology by critical psychology and, more broadly, body studies. The specific focus is on the neurological body whose dogmatic exclusion from critical endeavours is challenged by arguing that neuroscience offers a vital resource for emancipatory agendas. Rather than conversely treating biology as a site for the factual supplementation of social theory the aim is to engage (negotiate) with neuroscience more directly and critically. In this process a discursive reductionism and attempted escape from complicity associated with critical psychology are addressed. Similarly a naïve and apolitical empiricism claimed by neuroscience is disrupted. The primary objective is however to demonstrate the utility of neuroscience in developing critical theory. These objectives are pursued through the 'method' of deconstruction, (mis)reading several highly regarded neuroscience texts written by prominent neuroscientists, working within the convolutions of these texts so as develop openings for critical conceptualisations of (neural) corporeality. In this manner the various spectres associated with neurology, including essentialism, determinism, individualism, reductionism and dualism, are displaced. This includes, amongst others, the omnipresent mind/body and body/society binaries. The (mis)readings address a number of prominent themes associated with contemporary neuroscience: Attempts at specifying an identity for (part of) the brain are shown to rely on a necessary relationship with the excluded other (such as the body, the socio-cultural, and the environment). Similarly, attempts at articulating a centre, a point from which agency can proceed, which finds existing identity in the functions of the prefrontal cortices, are also undone by the (multiple, affective, and unconscious) other which decentres the centre by being the essential supplement for any such claims. The causal metaphysic must likewise proceed within the play of *différance*, a logic of difference and deferral that undermines causal routes, innate origins and autocratic centres. Finally, reductionism must advance as a necessary strategy through which to engage with complexity, its ambitions always impossible as the aneconomic is forever in excess of any economy. The emancipatory viability of such (mis)readings is discussed within a context where the open and malleable body has been co-opted by contemporary neo-liberal geoculture.

Key terms:

Biology; Body; Body studies; Cognitive science; Connectionism; Corporeality; Critical psychology; Deconstruction; Embodiment theory; Neurology; Neuroscience; Post-structuralism; Social constructionism

INTRODUCTION

CHAPTER 1
THE PARASITE, ITS HOST, ITS OBJECTIVE

> **păr**asīt**|e** *n.* Self-seeking hanger-on, toady; unprofitable dependent; animal or plant living in or on another and drawing nutriment directly from it; **păr**asī**'tĭc** *a.* (**-ically**); **~ism** *n.*; **~ize** *v.t.*, infest as parasite. (L f. Gk (PARA-, *sitos* food)]
>
> (Sykes, 1978, p. 639)

> The me [*moi*] of modern man (sic)… has taken its form in the dialectical impasse of the beautiful soul who does not recognize his (sic) very reason for being in the disorder he denounces in the world.
>
> (Lacan, 2002, p. 69)

This project is parasitic; it infests the other, the sustaining blood of its host runs through its veins. It is not a modest freeloader, its hosts, though of the same species, are multiple, its infestations without embarrassment. This absence of shame is not due to a lack of insight or character (it tells itself) but the recognition of a reality and a consequent ethical self-positioning. In part it hopes to escape an accusation, that of being a 'beautiful soul', the pure other who, wringing its hands in infinite agony, decries the iniquity of the world, forever identifying its transcendence over those others who assume the same position, never seeing how the sin of the other is what constitutes its own being (No Subject, n.d.). The parasite hopes to escape this morality of sanctity by acknowledging that the Garden of Eden has been left and that, in fact, the myth of this holy precinct is the lure for beatific preoccupations *par excellence*. The parasite will not be disassociated! So it concedes that it is always already contaminated, constantly and originally complicit, in the chaos and evil of that which surrounds it; it is fallen and spoiled. This project opens with this confession, not for the sake of absolution, but so that my position is clear, that you can take aim at me with more precision, and so that I may proceed to hopefully articulate (through stolen notions, logics, strategies and agendas) something of critical utility.

The complicity referred to here is, as Wilson (1998) points out, that of the 'faithful transgression' (p. 36). One reading of 'para' is to 'protect' and this parasite must take care of its host for it realises that without it it is nothing. This fidelity should not be misconstrued as that of the parasite-in-general, the sociopath, anthropomorphically stated, but one of love, for this parasite-in-particular must love what it infests otherwise it looses

its potency and agenda. However, though the parasite may be reliant on its host for its coherence and utility, it is still in a parasitic relationship. This is 'para' as in 'beside' and 'beyond', for the parasite is not its host, but then it is also not its identity without its host. Thus the blood of the other, its food, invades it and constitutes it, the outside is on the inside. The affection of the parasite-in-particular is not without effect on its host, for it would then loose its identity as parasite. It thus unavoidably transgresses the unity of its other and this is hence a love that changes (perhaps imperceptibly) that which it has become enamoured with. But this is not a naïve or romantic love since it recognises that there never was an innocent to be wooed here, that its infestation only reveals contaminations that have always been there. Nor is this a tragic or fickle love, the non-love of the *belle me* (beautiful me), for the result is not the destruction of the host but a de-construction that, knowing there is no purity to protect, engages in the wonder of where this relationship may lead.

One may ask whether this is then not a symbiotic relationship, one where both mutually benefit. The answer slants toward the negative since when one's host is neuroscience one must realise that this is most likely to be an unrequited love that will have to be very patient. The host's domain is ubiquitous, its personnel and sites are well institutionalised, its methodological habits are deeply entrenched, and its discourses rehearsed to the point of scripture. And so, when the parasite is mentioned, if its name is not met with a blank stare or quizzical raising of the eyebrow, it is instantly dispatched to the 'humanities', for deconstruction still finds its most celebrated practitioners mostly in literary criticism and language departments (if the list of contributors to Royle (2000) counts as a quintessential example). But the intention is not to find acceptance from the doyens occupying neuroscience's multiple edifices, to establish some new tradition and truth amongst the various others jostling for institutional space and capital. The aim, as will be made clear in this chapter, lies elsewhere, closer to the ambitions of critical psychology. Hence something irreducibly parasitic remains in this relationship. The parasite that infests these pages is then something askew; neither leech nor symbiote, both vampire and companion.

Before making one final confession and closing this opening section, it should be noted that deconstruction also does not enjoy great popularity in the social sciences, including (critical) psychology, and is itself host to a plethora of misreadings and stereotypes (Hepburn, 1999; Kirby, 1997; Royle, 2000; Wilson, 1998). This thus leaves 'it' a rather impotent-looking parasite in relation to neuroscience and a misunderstood, at best politely-tolerated, comrade for those with emancipatory intent. The line identified in this project is thus thin but, as will be demonstrated, is well worth walking.

This project has its origins and defines it objectives through the engagement with a number of writers, specifically Cromby (2004) and, predominantly, Wilson (1998, 2004). It is accordingly traditionally and unavoidably (and thus unapologetically) parasitic. The agenda and aims I will specify in the rest of this chapter (of course) have a history and a community; the project's programme is that of the 'sub-discipline' of critical psychology, as much as such a unified objective may be articulated for such a loose collective, whilst its aims are versions of the ambitions specified by the above researchers and the more specific 'communities' they represent. The project thus emerges from an engagement with a diversity of texts, engagements that celebrate (in that its draws life, direction and energy from these writings), critique (in a traditional negative sense) and de/construct (in that it seeks openings and new ways ahead through a negotiation with the other).

The next section will address the notion of 'critique', articulating a distinction between 'critical' and 'mainstream' psychology, and again referring to the notions of 'parasite' and '*belle me*'. This will be followed by a brief discussion of the '(re)turn to the body', moving in the next section to argue that there remains a lingering anti-biologism in body studies, a subtle retreat from our biological particularities and their propensities. The objectives of this project are then specified prior to providing a brief outline of its chapters.

THE 'CRITICAL' OF CRITICAL/MAINSTREAM PSYCHOLOGY

> **crĭ'tĭcĭsm** *n.* Judging of merit of works of art and literature or of persons and things in general; expression and exposition of such judgment; any detail of such exposition esp. the pointing out of a fault; censure…
>
> (Sykes, 1978, p. 194)

On more than one occasion I have been asked, after pointing out an investment in critical psychology, whether psychology in general is not 'critical'? Indeed, criticism in general is an essential aspect of any scientific or intellectual enterprise, even for one as dubious as psychology, but 'critical' is used in a specific manner in critical psychology and this makes all the difference. I will address this here by considering the distinction between critical and 'orthodox' psychology (Ivey, 1986, p. 24).

Prilleltensky and Fox (1997) argue that the distinction between 'critical' and 'mainstream' or 'traditional' psychology is 'fundamental' in terms of 'values, assumptions, concerns and objectives' (p. 3). The distinction is that the concern of the former is with social justice and human welfare. One may then indicate that mainstream psychology shares such a concern; for example, is psychotherapy not one of its main areas of development and contribution? The response is that mainstream psychology, whether in empirical-analytic or hermeneutic guises, engages in practices and adheres to norms that are conservative in their effects and, since contemporary society is marked by oppression and inequality, such a psychology is then instrumental in sustaining an unjust status quo (Ivey, 1986; Prilleltensky & Fox, 1997). Critical psychology questions traditional psychology's claim to objectivity and the very notion of a value-free science. Instead traditional norms are regarded as based on upper and middle-class (usually white and male) assumptions, values and interests. In addition, it emphasises and promotes individualistic rather than social understandings of problems, what Dafermos and Marvakis (2006, p. 9) refer to as the 'psychologisation of social phenomena'. Hook (2004) describes this as the isolation of the individual from the social (and material) world, the removal of the intersubjective from the ideological, and the separation of the psychological from the political. This reduction to individual propensities and deficits detracts from research and theories that reveal the lattice of power relations that sustains the status quo, in this way privileging the interests of the powerful and as a

consequence sustaining the oppression of the powerless. Psychologists are therefore considered as paying 'lip service to equality' whilst supporting an exploitative capitalist order and the freedom of the free market, which effectively excludes and produces those with fewer resources (Prilleltensky & Fox, 1997). Furthermore, any recommended structural reforms by the mainstream are at best 'minor', coached in the rhetoric of being 'practical' and 'reasonable', effectively leaving intact an unjust social system.

Critical psychology (not a term generally agreed to or even commonly used by its practitioners) is defined by Prilleltensky and Fox (1997) as 'a variety of approaches that differ in philosophical justifications, terminology, political strategy, and ultimate priorities' (p. 4), including disparate methodologies, and is thus fraught with differences, disagreements, and contradictions. These 'critical psychologies' refer to, amongst others, community psychology, critical psychiatry, cultural psychology, critical realism, discursive (including narrative and dialogical) psychology, feminist psychology, German critical psychology, neo-Marxist psychology, postcolonial theory, some psychoanalytic approaches, social constructionism, South American liberation psychology, postmodernism, and post-structuralism, most of which tend to be heterogeneous and prone to cross-fertilisation (Cromby, 2004; Dafermos & Marvakis, 2006; Hook, 2004; Ivey, 1986; Prilleltensky & Fox, 1997). Despite this multiplicity, Prilleltensky and Fox (1997) identify a 'shared interest in challenging a status quo that benefits the powerful and works against the powerless' which makes it 'necessary to advocate certain values and forms of political action rather than try to appear objective simply to retain [institutional] legitimacy' (p. 7). In addition to this emancipatory intent, they refer to certain shared 'basic values' including a concern with social justice, self determination and participation, collaborative decision making, caring and compassion, distributive justice, health, and human diversity. They confess to difficulties in defining and implementing these values partially due to the need to acknowledge the diversity and dynamic nature of socio-political contexts. This is no understatement as ongoing debates testify to the intricacies of such notions as social and distributive justice and participation (Stanford Encyclopaedia of Philosophy, 2007; Yen, 2008). Given this, the pursuit of the Good Society should not be crippled by mainstream 'more research is needed' rhetoric or the argument that trading in ideals inevitably implies

impracticality and is thus unavoidably a waste of effort (Prilleltensky & Fox, 1997, p. 18; Stanford Encyclopaedia of Philosophy, 2007). Rather, it may be argued that an aspect of a Good Society is the refusal to be duped into a utopia politics and that continuous critical reflection, debate, cautiousness and social change are unavoidable and essential (Dreyfus & Rabinow, 1983).

By indicating their distaste for the social status quo and that critical psychology's general intent is to 'eliminate oppression, promote social justice, and redirect society's values' (p. 16), Prilleltensky and Fox (1997) echo the Marxist injunction to not simply interpret the world but to change it (Ivey, 1986). Their objections to the mainstream simultaneously define critical psychology's objectives: i) Psychological research does not generate objective facts nor is it value free but is embedded in the subjectivity of its developers and is put to political (ideological) use in the legitimation and naturalisation of inequalities. These covert values should thus be made explicit and research should rather be used to assist oppressed groups (Dafermos & Marvakis, 2006). ii) Problems understood in terms of individual deficits exclude the effects of relations of power; this then indicating the need for more holistic understandings of such struggles that take the social and political seriously (Prilleltensky & Fox, 1997). iii) The Good Life as individual actualisation and the accumulation of material wealth is inevitably exploitative to which reciprocal self-determination embedded in a notion of distributive justice is an alternative. iv) Orthodox psychology's practices and theories support capitalist principles and the advancement of the powerful rather than mutuality, democracy, and distributive justice. This is enabled by v) an expert stance in professional relationships which is, at best, naïve about the workings of power, and vi) a professional ethics which predominantly serves the interests of professionals and authority. Given this, the voice and agenda of the marginalised needs to written into and addressed by psychology.

Dafermos and Marvakis (2006) identify several 'stages' in the development of 'critique' in critical psychology, all of which contrast with a mainstream rendering of 'criticism' as evaluations that allow for conceptual clarifications, methodological improvements, and

consequent improved objectivity. The first 'step', roughly emerging in the 1960s[1], is what Dafermos and Marvakis (2006) refer to as a 'political-ethical' critique focussing on the abuse (e.g., by the military, industry, and psychiatry) of psychological knowledge and practices, and the absence of a relevant psychology for politically marginalised groups, a critique that does not question the status of psychology as science (Painter, Terre Blanche, & Henderson, 2006).

The second stage of 'sociological' analysis, attempts to articulate the relationship between psychology, as institution, and a society typified by relations of inequality and multiple agendas. Here psychology's socio-political role is sketched as an applied discipline offering technologies for the subjugation and management of various types of groups or individuals thus enabling social control (Hook, 2004). In this sense psychology may be understood as a thoroughly social science with social objectives (Rose, 2008). The question of who produces what knowledges and technologies for who becomes salient. This is a critique emerging from outside of psychology which typically results in mainstream rejections of such critique as being 'political' and as not enabling the development of more objective methodologies (Dafermos & Marvakis, 2006).

The third line of critique, emerging particularly from the 1980s onward, moves beyond a reading of psychological notions and practices as oppressive to considering how they constitute particular subjectivities (Dafermos & Marvakis, 2006). This highlights a 'politics of subjectivity' in addition to a 'politics of knowledge' (Hook, 2004, p. 15). It challenges the image of psychology as a descriptive science and highlights the cultural and historical embeddedness of its notions and its profound constructive and thus political effects (Rose, 2008). For example, the assumption commonly made in psychology of the private, coherent, autonomous self, that is, the self-transparent disembodied Cartesian subject, is demonstrated to be a construction, a mediated artefact, of a particular socio-historical context, that of western modernity (Cromby, 2004). The idea of private interiority and the erasure of social context may be linked to bourgeois notions of

[1] This is not to say that critical readings and utilisations of psychology were absent before the 1960s. Foster (2008), for example, notes the Marxist writings of South African psychologist, J. G. Taylor, in the 1940s.

subjectivity, a form of subjectification that, for those working from a neo-Marxist critical theory position, requires a transcendence of false consciousness that enables insight and consequent political agency (Dafermos & Marvakis, 2006; Ivey, 1986).

Dafermos and Marvakis (2006) end their review by pointing out that these engagements by critical psychology remain at the level of a critique of psychology, revealing the need for a move beyond negation to the positive project of the '*development* of a *new* psychology' (p. 16, emphasis in original), that is, the establishment a 'substantive alternate approach' (Ivey, 1986, p. 4). Hook (2004) also emphasises the need, in addition to ongoing general and local critique, to 'convert critical sensibilities into a kind of critical response or action' (p. 11). This is the activist role identified by Prilleltensky and Fox (1997), where psychology becomes a tool or weapon for social change. The aim is then not to eradicate psychology, since its subject matter, psychology, is indispensable to the emancipatory programme[2], but to use it to make sense of, reconnect to, and grapple with power (Blackman, Cromby, Hook, Papadopoulos, & Walkerdine, 2008; Hook, 2004; Ivey, 1986). It is at this point where critical psychology is called to become a positive producer itself, adopting an identity less dependent on its mainstream other, that we need to consider the relationship and distinction between 'critical' and 'mainstream' psychology more carefully.

What are the consequences of critical psychology having become (at least in the United Kingdom and South Africa) a 'relatively distinctive subdiscipline' (Blackman et al., 2008, p. 13)? It may be argued that its institutionalisation (in university departments and in various under- and post-graduate courses) holds the promise of it becoming a 'form of loyal opposition' rather than a truly subversive force (Painter et al., 2006, p. 231). Blackman et al. (2008) admit that such subversion has not yet occurred (at least not in the British academy) but that there are a generation of academics working '*from the inside*' toward such change (p. 13, emphasis in original). However, as Wilson (1998) points out in considering the institutionalisation of feminist psychology, the consequences of such a strategy needs to be carefully considered since it risks co-option by what is being opposed

[2] For example, the failure of the May 1968 Paris student uprisings to develop into a revolution of the proletariat was understood, at least by the neo-Marxist Frankfurt school, as being due to the absence of a theoretical and practical engagement with subjectivity (Blackman et al., 2008; Ivey, 1986).

with a subsequent paralysis of the critical agenda. Similarly, Painter et al. (2006) wonder how a strategy, used by some critical psychologists, of reworking traditional psychology categories risks such work being absorbed into the mainstream and its political tradition. Wilson's response to this danger is to articulate the necessary but impossible position of a critical project: On the one hand, a programme that stays on the outside of the discipline cannot engage with it in any real way. This hints again at the position of the *belle me*, the critic that rants from the margin but is unable to bring about change in fear of getting his or her hands dirty. On the other hand, to work within institutional structures risks pacification and co-option. For Spivak (as cited in Kirby, 1993, p. 26), this aporia requires us to negotiate 'inevitable violations'.

Generically stated, critical psychology fears repeating the violence associated with mainstream psychology. The usual tactics advanced for avoiding such participation are reflexivity (rigorous self scrutiny and honesty), continuous vigilance and good intentions (Kirby, 1993; Wilson, 1998). This results in the development of a number of routinised injunctions, that is, one must beware of engaging in universalism, binary thinking, individualism, essentialism, cognitivism, biologism, determinism and reductionism. Such concern then translates into the whole scale avoidance and rejection of the knowledge structures of mainstream psychology. These strategies are however problematic on several grounds: First, they assume a Cartesian notion of self, where one's intentions are always transparent to the self; second, they suggest that a pure and non-violent position is possible; and, third, they enact the strict separation of a binary effectively excluding areas of mainstream psychology (e.g., neuropsychology and cognitive science) as potential critical resources. Kirby (1993) and Wilson (1998) point out, that any attempt to know, understand or read the world is inevitably an act of violence or, in less dramatic terms, it is always a process of translation and thus transformation. The pure/fallen and transparency/violent binaries cannot hold since contamination and violence cannot be avoided. The attempts to secure such positions cripple the critical project, by excluding essential areas (e.g., the biological) and theoretical resources (e.g., neurology) associated with the nefarious other, and by introducing another form of violence, that of the *belle me* where one denies one's own capacity for violence and thus smothers both the 'evil' and 'oppressed' other in the

'truth' of one's projections. Given that the feared act cannot be escaped, this troubles the hope of developing a pure new psychology, free of past sins. This does however suggest the possibility of another strategy, that of negotiation, which does not read engagement with the other as a sign of pathology, betrayal, conservativeness, or error. Instead it acknowledges that we can still decide *how* to read the other and that part of this process is a continuous disentangling of our involvement in relations of power as such, not as projected onto and isolated in the mainstream other (Bennington, 2000; Kirby, 1993).

It is now possible to point out a distinction between three forms of critique: The first two refer to the traditional critique of mainstream psychology and the socio-political critique of critical psychology which share a common investment in negation. The need for logical rigour and clarity in the analysis of concepts, theories, methods and evidence, that is, those critical skills generally promoted in psychology cannot be faulted but, as will be argued in Chapter 4, such critique operates within an epistemological, ontological and methodological framework that also needs to be acknowledged and interrogated since otherwise conservative effects cannot be made visible nor remedied. Furthermore, the positive project of developing a 'new' psychology, drawing on theories and practices that more fully acknowledge the social and the political, is also necessary. But, as I will argue in the next section, such a psychology needs to be aware of its own routinised objections, generalisations and exclusionary practices (Kirby, 1993; Wilson, 1998). Such an interrogation of its own grounds and naturalised proclivities will allow critical psychology to address such exclusions since, as will be argued in Chapter 3, to not do so is to sabotage the critical agenda. This requires it to engage with its own dogma and its other, requiring a third form of critique, that of negotiation.

The above section referred to the dangers of the institutionalisation of critical psychology as well as the risk of engaging positively with the concepts, theories, methods, and claims, that is, the knowledge structures, associated with the mainstream. As I will argue more fully in Chapter 3, such a negotiation with its inevitable risk of complicity is essential for the critical project. This requires engaging with, what Cromby (2004) refers to, as the

'troubling spectres' of reductionism, essentialism, dualism, and individualism (p. 4). I introduce this concern in the context of body work in the next section.

NEGOTIATING THE BODY

Over roughly the last two decades an attempt to more fully include the body has manifested itself in the social sciences, including, more recently, critical and mainstream psychology. In critical work this has, in part, been inspired by the shift in focus from the subject to the body, from the work of Louis Althusser to that of Michel Foucault, the latter arguing against a preoccupation with consciousness raising as a way to surmount ideological effects by examining the disciplining of bodies via power/knowledge relations (Blackman et al., 2008). In mainstream psychology the turn to materiality has primarily been in the form of an alliance with neuroscience and has thus mostly been limited to the brain, although a second generation of cognitive science, a so-called embodied cognitive science, has emerged as a significant force (Schouten, 2007; van de Laar & de Regt, 2008)[3]. However, as Blackman (2008) and Wilson (1998) point out, the body has never been truly absent from either sociology or psychology but rather has been in attendance in the form of the 'absent presence' of the mute and passive body.

As will be described in more detail in Chapter 3, the dominance of social constructionism in critical psychology since the 1980s is tied to the linguistic turn in social science (Durrheim, 1997). The concern with language as constitutive and not simply representational was especially notable in the so-called *weak* version of this diverse montage of approaches. Drawing on discourse analysis, ethnomethodology and conversational analysis to focus on the details of discourse, this version has been accused of marginalising materiality and/or the extra-discursive (Blackman, 2008; Cromby & Nightingale, 1999). In the *strong* version, the body as sculpted or inculcated through social techniques and practices featured more strongly. Here, however, the criticisms were that the body is positioned as inert and that the lived body (the phenomenology of a body-subject in process in the world) is left unaddressed (Crossley, 2001). What was made

[3] This (re)turn of mainstream psychology to the body will be addressed in more detail in Chapter 3.

apparent was that reclaiming the body from asocial readings (that is, the natural or pre-social body) resulted in the maintenance of a material/social binary, this time in the form of social determinism (Blackman, 2008). Engagement with the body as text or the body as socio-culturally moulded fails to take its aliveness or vitality into account, either reducing this to a naturalised physiology or to an amorphous matter brought into being through the puppetry of socio-cultural inscription. Given this, Cromby (2004) claims that critical psychology, at least in its social constructionist guise, has failed to develop an account of embodied subjectivity that takes corporeality seriously. In addition, an impoverished engagement with materiality is hazardous on several counts; it is guilty of covert idealism and Cartesian dualism, fails to articulate a comprehensive critical engagement with the world, and results in discursive reductionist accounts of corporeality, experience, agency and the political (Cromby & Standen, 1999).

The acknowledgement of the body has given rise to a proliferation of scholarship and research. This has been referred to as the 'turn to the body', with 'body studies' emerging across the social sciences, including critical psychology (Blackman, 2008; Blackman et al., 2008). This includes a continued focus on the socially sculpted body, drawing on the foundational work by Pierre Bourdieu and Michel Foucault, but concentrated on understanding specific social differences. The body has thus been studied as, for example, classed, gendered, sexed, transgendered, racialised, queer, and sexualised. Such topics have also been pursued in more phenomenological research, engagements with the body-as-lived, often drawing on the work of Maurice Merleau-Ponty, and focussing on the experience of being a socially embedded body-subject. This has included developing more nuanced readings of the senses, such as taste and smell, revealing their social embeddedness. Although challenging fixed notions of the body by recognising it as surprisingly malleable and always en-route or unfinished, such work tends to be based on a social influence model, that is, as operating through a social/material binary which continues to position the body as inert (Blackman, 2008). Consequently, attempts have been made to articulate an embodiment model which challenges dualistic understandings by starting from the assumption that there is no distinction between nature and culture. Studies emerging from especially sociology and anthropology have focussed on the

communicating body, highlighting the remarkable ways that bodies are permeable, able to connect, co-operate and influence each other beyond verbal or digital means. This has resulted in the recent 'turn to affect' which has thoroughly dislodged body work from more discursive research. A further theme that has appeared is the emphasis on movement and process, that is, the processual body or body-as-enacted, which has challenged an understanding of our bodies as clearly circumscribed, instead conceptualising them as intertwined dynamic materialities repeatedly bought into being through action in a network which includes a diversity of techniques, technologies, objects and (human and non-human) others.

What tends to guide body studies (and critical social science in general) is the fear of housing a number of 'troubling spectres' (Cromby, 2004, p. 4). This typically refers to the 'interdependent scourges' of essentialism, reductionism and dualism (Blackman et al., 2008, p. 17), but also extends beyond this to another set of '-isms'; biologism, naturalism, universalism and, in particular, individualism (Blackman, 2008; Grosz, 1990). Essentialism involves the attribution of an essence to an object, other or group which is considered to be fixed and given and, for groups, common to its members (Grosz, 1990). Naturalism is a form of essentialism where the essence is regarded as being God-given, ontological or biological (referred to then as biologism), in other words, a natural or unalterable aspect of the identity in question. Universalism refers to the attribution of a commonality to all members of a group irrespective of time and socio-cultural context. Whereas essentialism may be used to account for variation in a group (e.g., some members having a recessive gene), universalism affirms similarities and homogenises a group. Biologism is usually regarded as reductionist, where a set of facts or entities (e.g., social phenomena and behavioural propensities) are explained in their entirety on the basis of another set of facts or entities (e.g., biology), that is, one realm is regarded as the effect of another. The above 'conceptual commitments' are considered as politically dubious since they position a person or group as unalterable thus rationalising their social position in terms of rights and responsibilities (Grosz, 1990, p. 335). This has a conservative effect, justifying the social status quo, and thus opposes the fundamental revisionism of critical projects (Hook, 2004; Prilleltensky & Fox, 1997).

Dualism, the positing of binary opposites, is a feature of the logic associated with the metaphysical tradition that permeates western thought (Culler, 1982)[4]. It is usually criticised on two counts: First, that it posits a vivid distinction between two terms (e.g., mind/body) thus instating a separation which simultaneously raises questions as to how such distinct terms can relate; that is, the 'interaction effect' (Blackman, 2008, p. 131; Cromby, 2007). Second, such terms are structured hierarchically, where one term is positioned as primary, complete and superior and the other as secondary, supplemental, and subjugated (Blackman, 2008; Hepburn, 1999). This introduces a political effect where, for example, women are defined by, and superfluous in relation to, men. Finally, individualism, mentioned in the previous section, refers to a notion of the subject as atomistic, coherent, bounded, autonomous and rational (Blackman, 2008; Cromby, 2004). This is a particularly western construction whose emergence can be traced historically with the development of liberal democratic societies (Blackman, 2008; Louw, 2002; Rose, 2008, Stenner, 2004). As indicated, it is a conceptualisation closely associated with mainstream psychology, which divests the subject of its social context, allowing for the ascription of various propensities and pathologies to the individual, resulting in the proliferation of asocial theories which sculpt a psychological interior (Blackman, 2008; Rose, 2008). This is supported by various individualising technologies (e.g., psychotherapy, psychopharmaceuticals, and self-help literature). Again, given that it is a concept which locates social problems *in* the individual, it has a conservative effect

The avoidance of such spectres resulted in sociologists and critical social scientists (e.g., feminists) not engaging with the corporeal since the body was strongly associated with naturalism, the so-called 'naturalistic body', and with biologism, that is biological determinism (Blackman, 2008, p. 37; Wilson, 1998). The conflation of biology with biologism, which remained unexamined due to dogmatic and naturalised exclusionary practices, resulted in the same politically conservative effects as the avoidance of the body did, including the forsaking of the biological to the conservative strategies and conceptualisations of mainstream psychology and neuroscience (Wilson, 1998). This

[4] This is explored in greater detail in Chapter 4.

exclusion of biological materiality has been addressed through a number of routes, including feminism (e.g., Grosz, 1994b, Kirby, 1991, Wilson, 1998) and critical psychology (e.g., Cromby, 2004, 2007) which has resulted in recent engagements with biology as theoretical resource rather than as object for critique and exclusion. This includes work drawing on particularities such as the central nervous system (e.g., Cromby, 2004; Lewis, 2002; Watson, 1998; Wilson, 1998, 2004), the endocrine system (e.g., Brennan, 2004), and the enteric nervous system (e.g., Wilson, 2004).

At the same time, the turn to the body in mainstream psychology, in lieu of acknowledgements of the spectre of Cartesian dualism (Clark, 1999; Schouten, 2007), has made use of cybernetics and field theory so as to articulate an embodied cognitive science (e.g., Dautenhahn, Ogden, & Quick, 2002; Thelen, Schöner, Scheier , & Smith, 2001; van de Laar & Regt, 2008). It has also developed a more intimate relationship with the neurosciences, resulting in the huge expansion of such disciplines as cognitive neuroscience and neuropsychology (Lezak, Howieson, & Loring, 2004; Nell, 2000; Rose, 2008).

Dafermos and Marvakis (2006) echo Wilhelm Wundt's distinction by predicting an escalating division of psychology into two fields, that of 'individualistic-cognitive-neurological' psychology and a generalised social psychology (p. 1). What this indicates is a foundational distinction between the individual and the social, a division that critical psychology has been at pains to address (Blackman, 2008; Cromby, 2004; Hook, 2004). However, Wilson (1998), in her discussion of feminist psychology, notes that sub-disciplines associated with the former (e.g., cognitive psychology, neuropsychology) usually lie unaddressed or excluded wholesale in critical agendas, either regarded as falling outside of the political or as toxic to any emancipatory agenda. Where there have been forays into the biological by social scientists, this appears to mostly (although definitely not exclusively) involve the grafting of biological work onto social science. As Blackman et al. (2008) point out, 'the natural sciences are now becoming authorised sites for humanities scholars to poach and invent new vocabularies for re-thinking subjectivity' (p. 20). The question this raises is what a more intense engagement with and contamination by (let's

say, a wallowing in) the biological sciences (specifically neuroscience) can offer body theory and, more broadly, the critical agenda?

Furthermore, in what shape will this leave the feared spectres and their exorcists? Grosz (1990) asks how a political project (such as feminism), which inevitably requires abstraction (such as the notion of 'woman') so as to bring a collective into being, can proceed when essentialism and universalism[5] are forbidden acts. Is it always a choice between theoretical purity and political pragmatism? Instead, as signalled in the previous section, we need to negotiate always impure positions; a politics that is constantly implicated in what it contests and a theory that is forever political. The *belle me* who clings (ironically) to the universal myth of conceptual purity (essence) forsakes strategic utilisation for orthodoxy. The repeated exorcism of the various '–ism' ghosts discussed above surrenders us to the conceptual and very real outcomes of social determinism, inert materiality, discourse reductionism, political impotency, self satisfactory campus activism, and the very oppositional logic we wish to escape. This project therefore plans to go where beautiful souls fear to tread. It seeks to engage directly (but definitely not naively) with the texts of the occult (of neuroscience), to trace their convolutions, incantations, and images, and to get to know them as a parasite would its host; as food that may yet surprise in terms of the theoretical sustenance it may provide. I therefore turn in the final section to specifying the objectives of this project before providing an outline of the structure used in its presentation.

'NEGOTIATING ENABLING VIOLENCES': OBJECTIVES AND STRUCTURE

This project focuses on a particular corporeality, what Wilson (2004) calls the 'neurological body', the body of neurons and the structures and relationships they constitute. This is the material domain over which the neurosciences claim their expertise and, consequently, the project limits the scope of its critical engagement to texts typical of this discipline. These are the practical limitations that are adhered to here, the consequences of which will be reflected upon in the closing chapter.

[5] In Chapter 7 I will argue that reductionism also requires careful consideration prior to universal rejection.

Acknowledging a history of mistrust between the neurosciences and social sciences, Cromby (2007) recognises the potential mutual benefit to both disciplines of a 'systematic collaboration' in terms of dialogue, theoretical development and empirical research (p. 149). Obstacles to this include linguistic, conceptual and methodological differences but also, politically, professional disjunctions built on distinct institutional traditions, structures and differential access to resources. The direct aim of this project is however not one of collaboration, one seeking reciprocal advantage, but rather is focussed on neuroscience as a resource for progressing the critical agenda. Here Wilson's (1998, 2004) comments are of direct relevance and played an indispensable role in articulating the current thesis.

It is Wilson (2004), amongst others, who asks the important question of what new liberating versions of the body become possible when we tolerate the presence of dreaded spectres such as reductionism and biologism. She recognises the presence, in feminist analyses (amongst others), of a neurophobia, a subtle distancing from or frank opposition to the biological; both moves ultimately resulting in foreclosure. Kirby (1991) points out that excluding something often means that it matters too much, that it already functions vitally in the constitution of our current being and the difficulties we experience. Where rapprochement is attempted, the embodiment model indicates that the biological should not be an addition, a supplementation, to the social but that a greater intimacy needs to be assumed and articulated, one that troubles any attempt to assert a biological/social binary (Blackman, 2008). The real consequence of constituting an inert or highly distinct materiality is that it distances the critical project from the radical potential that is the biological body. This calls for a return to corporeality, not as site for constitutive exclusion or conservative supplementation, but one that acknowledges the 'potential in the neurosciences for reinvention and transformation' (Wilson, 2004, p. 13), that the biological sciences can offer politically valuable perspectives for critical approaches (Wilson, 1998). Thus we need to 'build a critically empathic alliance with neurology' (Wilson, 2004, p. 29) and this where the reading of mainstream texts is a 'rarity in "our" critical domain' (Wilson, 1998, p. 5). However, the engagement with and re-evaluation of work from 'hard' neuroscience through the 'scriptures' that are published by some of its most respected

members, should be a movement of internal resurrection, a nurturing parasitism that transforms both the text and the reader (Blackman, 2008, p. 53; Kirby, 1991, p. 98).

As indicated above, the sciences tend to be read restrictively within critical approaches; as either offering objective facts, for use in supplementing social theory, or as being agents of social control, and thus retaining their status as targets for sociological critique (Wilson, 1998). Three summative comments may be made here: The first, reiterating the above, is that this distinction excludes the neurological body and its potential as subversive force. As Wilson points out; 'neurology may already enact and disseminate the malleability, politics and differences that they [writers in feminism] ascribe to only non-neurological forces', that is, the socio-cultural and the environment (p. 17). Second, what the above comment makes apparent is that a pathway needs to be discerned that does not read neuroscience as either fact or ideology, that is, one is needed that recognises the entwined contaminations of theories as always being political and language as always being constitutive. And, third, that sustained and detailed engagements with neuroscience as critical resource are still in their infancy suggesting that, for now at least, contact with the biological tends to (justifiably) be tentative and cautious.

The intent here is not to repeat a naive engagement with neuroscience texts, but to take seriously that the turf we are to enter is political and falls under the sovereignty of the spectres of a causal metaphysic, reductionism, individualism, and more (Cromby, 2007). If we are to read these scriptures then we must do so cautiously and aim for a mindful complicity by means of a set of strategies that recognise the complexity of what is at hand (Kirby, 1993). Here I will argue for deconstruction, the victim of a host of misreadings, caricatures and ostracisms (Hepburn, 1999; Royle, 2000; Wilson, 1998). Given such a poor reputation, this requires a careful explication and justification for inviting this 'method' into the fold. This is the focus and purpose of Chapter 4. For now let us consider the quote by Derrida (2004) that deconstruction operates 'to transform concepts, to displace them, to turn them against their presuppositions, to reinscribe them in other chains, and little by little to modify the terrain of our work and thereby produce new configurations' (p. 22). Such a claim is good grounds to suspect that deconstruction provides an excellent way to read

neuroscience texts. This is a form of reading that recognises the simultaneous necessity and impossibility of working with (metaphysical) concepts, the need for the faithful and parasitic intervention as we seek openings to novel and progressive configurations (Wilson, 1998). This may then provide notions and outcomes that will trouble certain readings of the body whilst offering surprising new routes for engaging with and making sense of our corporeality, and, beyond this, with other notions, such as agency and the social, with the spectres, such as reductionism, and the various binaries that haunt our theoretical and political practices. Ultimately this is about more than the neurological body, body studies, and neuroscience, but about the critical agenda and moving it forward.

The objectives then, simply stated, are: i) to disrupt a discursive (textual) reductionism often present in critical psychology, ii) to disturb a naïve (orthodox) empiricism present in neuroscience, iii) to expose some of the political/subjugating/ideological moments present in neuroscience writing, and, most importantly, iv) to make visible the critical, political and theoretical implications (potency) of neuroscience writing for body studies and, crucially, the critical agenda. I now end this chapter with a brief indication of the structure and the basic purpose of the chapters that constitute this thesis.

Chapters two and three, the 'Context' chapters, and Chapter 4, the 'Method and meta-theory' chapter, detail and expand on the various themes introduced above, setting the scene for chapters five, six and seven, the '(Mis)readings' segment. Chapter 2 provides a historical overview of readings of the body from the Ancient Greeks up to the early 20th century. This is structured to a great extent by focussing on the interpretations of corporeality by various philosophers. What emerges is that the body has always been construed in relation to some 'other' to bring about its identity, one of the most recent of these being the 'mind'. The second section of the chapter considers some more recent attempts to address this dualism within the context of the secular materiality of modern neuroscience. Several relevant themes are identified in this latter overview. The chapter thus provides an extensive longitudinal backdrop against and within which to understand the contemporary body. The following chapter then builds on this foundation but now restricts its view to the recent past and the writhing of mainstream and critical psychology

in relation to articulations of the body. Its adherence to psychology is not faithful as I include discussions of important foundational work more typically attributed to feminism, philosophy, and sociology in order to hone the trajectory of the narrative so as to set up more clearly the set of problems referred to above and thus the purpose of this project.

Chapter 4, which deals with the dimensions and strategies of deconstruction, has already been referred to. I embed the justifications for this set of procedures within a critical discussion of the notion of 'method' and end the chapter by detailing the criteria for the choice of texts '(mis)read' in the next part. The following three chapters then detail the deconstructive readings of three highly regarded neuroscience texts: Antonio Damasio's *Descartes' error*, Elkhonon Goldberg's *The executive brain*, and Joseph LeDoux's *Synaptic self*. The final chapter, the 'Discussion' part of the report, attempts to draw the themes of the various chapters together. It is an explicitly hybrid part, including the integrative dimensions of a discussion chapter as well as the reflexive and summative aspects of a typical concluding chapter. In another way it exceeds both of these forms by drawing on additional material in order to extend the themes developed across the preceding parts. Relevant notions and concerns from body studies, as well as themes not addressed in the 'Context' chapters, such as socialised biology, the molecular body, post-structural neuropsychology, and the body as assemblage, will be addressed in this chapter in relation to the openings identified in the '(Mis)readings' segment. The objectives of the project will be returned to, specifically the implications the (mis)readings hold for the critical agenda. The chapter, and project, then closes with a reflexive turn, focussing on the uses made of deconstruction and the inevitable limitations and sins of this particular piece of work.

PART 1
CONTEXT

CHAPTER 2
THE BODY AND ITS OTHERS

INTRODUCTION

This chapter consists of two sections. The first provides a brief conceptual history of the body wherein various 'others' (soul, mind, environment and society) are identified against which corporeality has been defined. Depending on the context, these components are allotted particular attributes which sets up a specific (problematic) relationship between these terms. The privileging of a certain binary (e.g., mind/body) then leads to the remaining terms (e.g., environment and society) being articulated along the line of reasoning established by the primary opposition. These others have had profound consequences for the body, resulting in it, as we will see, being vilified, mechanised, pacified, energised, unified, multiplied, and historicised. The body has consequently occupied various locations, from almost complete exclusion to forming the very heart of theoretical work. In this sense this and the next chapter may be read as a chronology of the body's various inclusions and exclusions from theoretical work.

The second section deals more directly with the history of neuroscience and the body or, more accurately, neuroscience and the brain since the body is very much an absent presence in this discipline. It proceeds in a similar fashion to the first section as two concerns, the search for a centre and the mind/body relationship, are repeatedly manifested. This section concludes with a review of the various dualist and monist positions adopted by neuroscience in relation to the mind. In exploring these various distinctions (and the attempted solutions to the difficulties arising from such characterisations) across these two sections, a recurrent set of problems become visible which form organising themes that can be traced across the remainder of this project, these representing the dominant routes through which its objectives will be achieved.

It is acknowledged that what follows is a typically Eurocentric narrative which traces ideas from Ancient Greece up to contemporary Western theoretical articulations. This seems

justified for several reasons: First, we cannot ignore the dominance of this tradition of thought in understanding the topic at hand. Second, we cannot present such ideas outside of their points of emergence, in some ahistorical fashion, where they stand in some simple relation to Truth. Such a stance would erase important contextual information, impoverishing our understanding of these notions. Third, this project admittedly rests on theoretical/empirical work emerging predominantly from North America and Western Europe. It is through the critical and reflexive engagement with this work that a context is provided for this project, one where several relevant themes become visible. There are undoubtedly other routes for similar projects so this venture follows the path specified without claiming any privileged position.

THE BODY IN THE WEST

Body and soul

According to Porter (2003), body/soul dualism emerged in Classical Greece in the 6th century BC. Preceding this was the view of the Milesian or Ionian nature philosophers who held that all that exists, being nature or *phusis*, was comprised of some general 'stuff' (Lakoff & Johnson, 1999). A distinct term for matter did not exist at the time and nature was regarded as comprised of four elements: Fire, Earth, Water and Air. These elements were not understood as passive, lifeless or mechanical in nature but as active and continuously in a process of change. The relationship between nature and the elements was explored. This included assertions about the status of the elements; Anaximenes argued for the primacy of Air (*aer*), Thales for the primacy of Water, and Anaximander proposed an indeterminate material, *apeiron*, which he argued preceded all of these elements (Blackburn, 1994; Lakoff & Johnson, 1999). Several fundamental distinctions emerged from this period that would permeate future thought; that is, that objects could be distinguished by their substance, form and process of change (Lakoff & Johnson, 1999).

In the writing of Homer in 8th century BC, the soul, *psyche*, or *pneuma* (as breathe, vital heat, or divine spirit) was simply seen as that which was essential for animation (Bennett & Hacker, 2003; Porter, 2003). Homer's protagonists were driven, puppet-like by external

forces and the often destructive whims of the Gods (Porter, 2003). Although this influential role of the Gods does not disappear, by the 5th to 4th century BC the notion of the *psyche* takes on a more internalised nuance. In the plays of Sophocles and Euripides, the protagonists are conscious subjects capable of reflection and prone to inner turmoil. Already in the 6th century BC Pythagoras had added a moral element to the soul and body division, identifying the former as divine and the latter as seditious and requiring mastery. This active element identified with the body contrasts with the earlier simpler notion of the body as passive and the soul as breathe as its animator. As will become apparent this inanimate view of matter would return in the mechanical metaphors of the Enlightenment.

Greek medicine, as developed in the Hippocratic corpus and later formalised by the Roman physician, Galen (130-200) , proposed a holistic understanding of the body as comprised of four humours or bodily fluids, which needed to be balanced so as to enable the maintenance of life (Porter, 2003). In this system, wellness was no longer in the hands of the fickle Gods, but was now grounded in nature and was diagnosable in the form of identifiable emissions. No clear distinction was drawn between the body and soul; the physical and the psychological were considered as two sides of the same coin. 'Animal spirits'[1] were regarded as animating the body, allowing sense and feeling. These spirits, a substance of ethereal texture, was given potency by the *pneuma* (Porter, 2003). Regarding both the soul and body as material in nature is noted in the work of Democritus (460-370 BC), who argued that the soul was comprised of particularly fine atoms, meaning that it, as a composite, was as perishable as the body (Porter, 2003). Later, Epicurus (341-270 BC) would argue that the free will associated with the soul was enabled by the 'swerve' of atoms (Blackburn, 1994).

The distinction between the soul and body was sharpened in the work of Plato (428-348 BC) who positioned the mind as superior to matter (Porter, 2003). Attributing rationality to the soul, it was the soul's task to combat the body's unreason and master its appetites. Interestingly the soul itself now became the site of a monist/pluralist debate within Plato's

[1] As indicated in the next section, Bennett and Hacker (2003) refer to 'vital pneuma' regarding 'animal spirits' as a later, Cartesian notion.

own work as he argued at times for a unitary soul (in *Phaedo*) and eventually settled for a tripartite soul (in *Timaeus*). In this version the appetites are also divorced from the body and located in the appetitive soul. This left the body a tomb, the site where the soul had to endure its fall to earth from the metaphysical world of Forms. The rational soul was still however considered superior to the other souls, all of which were located in the body. Rationality was located in the head, partitioned from the appetites by the neck. The linking of reason to the head and eventually the brain, establishing it as somehow apart from the body despite its materiality, is a partitioning still identifiable in recent work (Wilson, 1998).

A consequence of Plato's cosmology was the perception of the body as not 'an instrument of knowledge but as a hindrance to knowledge' which, amongst other things, resulted in the exclusion of the practical knowledge it embodied from the realm of formal knowledge (Bourdieu, 2004, p. 59). In addition to the body, other objects in the world were themselves but 'imitations' of ideas. The path to true knowledge was through the search for essences, immaterial Forms, which underlie all perceptible things (Porter, 2003). Whether located as passive and inert or in the active realm of the appetites, the body was aligned with the feminine, a materiality which required the rational mastery of the masculine (Butler, 1996). Feminine matter only took shape, and thus a recognisable identity, through the Form which preceded it. This relegation of the feminine took on a new form in the *Timaeus* where it became the receiving principle, the receptacle, neither shape nor body, through which the soul entered the world. Thus the phallocentric form entered the world, through the feminine but with no active assistance from her.

Linking the feminine to materiality persisted in the work of Plato's successor, Aristotle (384-322 BC). This was not surprising given the position of women and slaves in Greek culture as passive and subservient (Dreyfus & Rabinow, 1983). Ridding form of its metaphysical privilege, Aristotle retained the distinction between form (*eidos, morphé*) and matter (*prōtē hylē*) but emphasised their inseparability; form had no existence without matter and matter without form was merely potential; inchoate and undifferentiated (Porter, 2003). Without either, no entity (*ousia*) would emerge (Staten, 1984). The form of a living being was its soul or *psuchē*, passed on through the semen, *psuchē* being the form of the

(living) body. Bennett and Hacker (2003) emphasise that for Aristotle the *psuchē* was not mind, agent, substance, consciousness or the soul in a religious or ethical sense. Thus it is not an entity in itself or a part of the body. Rather it was a biological concept; that which gives identity (constancy) to indeterminable matter (Staten, 1984). Form is constituted by its 'first actualities', its dispositions or potentialities (*hexis*), these becoming second actualities (*energeia*) when exercised (Bennett & Hacker, 2003). The organs of the living being provide the potential for it to exercise the functions that make it the kind of entity that it is. When a creature can no longer exercise its essential powers it has lost its form and thus no longer exists. Again multiple souls emerge that animated the body; the higher rational soul (*nous*) or intellect and the lower irrational vegetative (nutritive) and sensitive souls (Porter, 2003). In this scheme the rational soul did achieve some form of trans-corporeal continuance, as it was itself split in two; one part passive and mortal, the latter active and everlasting. The latter played an important role in later incorporations of Aristotelian notions into Christian doctrines (Bennett & Hacker, 2003).

With Aristotle, the reality of the world was also no longer obscured by the immediate unavailability of ideas (Forms) but was rendered instantaneous and true by entities being unproblematically present to the senses (Lakoff & Johnson, 1999). What enabled this was the common form (*eidos*) of thought (*noésis*), language (*logos*) and entity (*ousia*) (Staten, 1984). This immediacy was not unique to humans but, within Aristotle's hierarchical categorical structure, was already present in the lower animals (Harré, 2002). Like the higher animals they were self-movers capable of acting purposefully (due to the sensitive soul) rather than merely reacting to the world. The capacities that distinguish humans, their ability to solve problems, think abstractly, and act intentionally, emerged directly from their form (specifically the rational soul). The notion of the goal directedness of the human species would however not go unchallenged during the Enlightenment.

During the age of the Roman Empire, the Stoics ensured that the status of the body would not improve, positioning the flesh as a demeaning bondage (Porter, 2003). It was important that the body was to be disciplined, eradicating its desire, as the occupant sought conformity with Universal Reason. The unreason of the body that threatened the soul was

to be contained not in order to discover some ascetic hidden truth but so as to demonstrate and exercise the limits of one's freedom; the ability to take charge of the self (Dreyfus & Rabinow, 1983).

Christianity emerged as the official religion of the Roman Empire in the fourth century (Porter, 2003). It adopted notions from both eastern Gnostic faiths and Greek metaphysics. This then included the notion of a separate, immortal and immaterial soul. As a patriarchal monotheistic religion the body tended to belong to the divine Father (Turner, 2006). Although this then located the soul/body distinction as central to this institutionalised creed, the nature of this relationship would not be a simple matter resulting in opposing viewpoints across the subsequent millennia (Porter, 2003): The flesh was a despised sign of the Fall for Origen in the 3rd century, in contrast to the flesh as an indication of God's creation and image, as argued by Irenaeus and Tertullian in the 2nd century. Central to this was whether the body was responsible for the Original Sin, for if it was then it deserved our complete contempt. This was contested by Saint Augustine and Martin Luther, centuries apart, who argued that it was the soul that was responsible for the first sin, meaning that the now passive flesh was not responsible for our suffering. The Resurrection during the Final Judgement also posed problems in that it raised questions about the relation between the body and soul: Would the soul return to the body as it was left in death; aged and worn? Or would we be granted a new heavenly body? Or would the soul exclusively, disembodied, enter into the kingdom of heaven? Despite Augustine's and others more positive readings of a neutral and passive body, it could not finally escape its condemnation. It remained a sign of the Fall for the Christian Platonists and the site of evil for Puritans in the 16th and 17th centuries (Porter, 2003; Turner, 2006). As the Puritan, William Prynne (cited in Porter, 2003, p. 39), wrote; 'What is the body, but a loathsome Masse, of dust and ashes, brittle as a glasse'. Nor could the body escape its gendered nature; for Milton in the 17th century it was identified with the (lower) sensual Eve, whilst Adam depicted (higher) reason and the soul. The images of women in the Old Testament were generally negative and the status of the Virgin Mary remained ambiguous and contested (Turner, 2006). Clearly then the question of whether there would be sexes in heaven was of some importance? The

dominance of these religious soul/body debates would be replaced with mind/body debates as the secularisation of the West emerged with the Enlightenment.

Mind and body

The rapid emergence of the new sciences in the 17th century, including the human sciences such as physiology, medicine and anatomy, promised to bring universal knowledge to those who sought it (Crossley, 2001). Given the dominance of the mechanistic metaphor, it also however threatened to constitute humanity as no more than a complex machine, eradicating both the soul so central to Christianity and the faculty of free will so important to the newly invented liberal Enlightenment individual. Against such a background the pursuit of an understanding that escaped the determinist threat was well justified. For René Descartes (1596-1650) the alternative would emerge through his exercises of radical doubt, where in he questioned everything in order to arrive at a point of certainty, a foundation upon which he could build a knowledge that could guide these new sciences. He concluded that the only thing he could not doubt, the only thing that could not possibly be an illusion or hallucination, was that he thought. This would then famously lead him to write; '*Cogito ergo sum*'; 'I am thinking, therefore I am' (Porter, 2003). Existence was proven given the unquestionable presence of thought. Upon this statement Descartes erected a dualist division between the mind and the world, of which the body was a part. These two 'substances' were radically distinct: Mind (*res cogitans*) was unitary, immaterial and thus outside of the realm of physical laws, whilst the body belonged to the realm of dimensional substances (*res extensa*), divisible and under the rule of the laws of mechanics. In this way, built upon a clear line of thought and logic, the mind would be protected from determinism, whilst allowing the continued understanding of the world through mechanical science. The mind would now require a different form of study to the body, one solely based on reason. The division between humanity, as mind, and the rest of the world was extreme; only we have consciousness, all other living things are *machina carnis*; machines of flesh (Porter, 2003). Being so completely rid of materiality, the 'thinking substance' could also now exist outside of the body, a point to be later exploited by cognitive science (Todes, 1996). The mind was furthermore of a particular essence, that of reason (Lakoff & Johnson, 1999). The appetitive, sensitive and vegetative souls of Plato and Aristotle were now firmly

dissolved into the body (Porter, 2003). Imagination, tied to sense perception, and emotion, as a bodily experience, was aligned with corporeality (Lakoff & Johnson, 1999). The mind was, like Plato's soul, clearly located above the body; reason was immediate and fully transparent (present) to itself and, unlike doubtable sense experiences, could be known with complete certainty. This did not imply the eradication of the divine soul which was allowed to co-exist, as a mute complementarity, an accommodation of Christian belief. In a growing secular age, the mind offered a naturalisation of the soul or, as Porter (2003) states, a 'soul for the thinking gentleman' (p. 68).

Discussed in more detail in the next section, the brain enters via Descartes' responses to the irresolvable problem emanating from his radical division; if these two substances (entities) were so completely different, then how could there be any interaction between them? For Descartes the intimate unity between mind and body was enabled through the pineal gland, the sole singular structure buried deep below the surface of the brain where the unitary soul could act on the body. In this scheme 'animal spirits' would act as the amazingly fine fluids in the nerves through which the soul could respond to the senses and act through the body (Porter, 2003). Significantly, Aristotle's direct access to the world was cast aside as the mind could now only experience (sensory) appearances and (conceptual) representations of the world (Todes, 1996).

Lakoff and Johnson (1999) point out that Descartes' scheme is not some historical curiosity to contemporary society, but we are rather left with 'a theory of mind and thought so influential that its main tenets are still widely held and have barely begun to be re-evaluated' (p. 408). Similarly, for Žižek (2000), Cartesian dualism is a spectre that still haunts Western thought. Crossley (2001) indicates that Descartes' dualism was a justified response to a rationality that promised to reduce humanity to products of physical causation and, although his response to this was problematic, the logic that Descartes was responding to is still with us and remains worthy of contestation. It is thus important to understand the limitations of Descartes' dualism both as a problematic scheme that still infiltrates our reasoning and as a failed response to causal reductionism. Crossley (2001) and Lakoff and

Johnson (1999) provide reviews of the criticisms that have been bought to bear on Descartes' dualism. These will be briefly outlined here.

Three sets of criticisms are identified; the first deals with the conceptual impossibility of Descartes' mind/body distinction, the second with his characterisation of the body, and the third with the impossibility of the social in such a scheme. As previously mentioned, given Descartes' radical distinction, the question remains as to how two substances, essentially existing in separate dimensions under the guidance of distinct rationalities, can interact. Given that such a distinction cannot be resolved on empirical grounds since any objective indication of mind would be a physical manifestation, the distinction remains only arguable conceptually. Essentially, states that are so completely independent cannot interact and the indication of something immaterial as a 'substance', as something spatial, shows the impossibility of conceptualising such a radically different substance outside of the materiality of our existence. This split between mind and body also introduces the problem of determining the accuracy of correspondence between mental representation and extended object. Second, in establishing the mind as the point of certainty, Descartes calls into question the certainty with which we could know that the body exists, ultimately arguing that it may simply be an illusion. The problem with such an argument is that it presupposes the distinction between mind and body. In an attempt to ground science Descartes already assumes that which he is trying to prove; the existence of matter, a notion central to the scientific community he was a part of. Furthermore, the body is assumed to be a physical object like all others, a distinct object open to empirical investigation. Yet our experience of our bodies is very different to that of objects that are external to it. As will be argued in the section on Merleau-Ponty in the next chapter, bodies are primarily not objects we experience but the very means of experiencing the world. Finally, given that the mind is a private realm which exists outside of the world; this would then also locate it as beyond the social. This would mean that it is prior to and thus beyond the influence of the social, entering fully formed into the world. The Cartesian subject is essentially an onlooker, the ultimate divorced scholar, never a part of this world. Socially we would therefore never encounter other minds, only other bodies, suggesting a radically individual and asocial subject. Language as a socially learned skill would then also be outside of mind; meaning

would have to be bestowed on this medium, in itself essentially meaningless. The idea that thought is enabled by language would be impossible in such a scheme since thought is essentially pre-linguistic. To conclude, what it means to be human for Descartes would exclude the body and the social, leaving us as a rational mind, ultimately unknowable and outside of all we encounter.

Three sets of responses emerged in the 17th century to Descartes' schema. These illustrate attempted solutions to his radical division, the first through materialism, the second through consciousness and the third through a notion of parallelism. Hobbes and Locke offered reductions of one element of the duality to the other whilst Spinoza maintained both whilst ridding the duality of both radical difference and causality. The solutions will be addressed again in more detail in the latter half of the second section of this chapter.

Of the philosophers emerging in the 17th century it was Thomas Hobbes (1588-1679) who for Rosenthal (2000) presented materialism in its purest form. All incorporeal elements, considered manifestations of Greek demonology, are to be cast away; there is no room for transcendental notions of a soul or mind (Porter, 2003). Even God and heaven are considered to be corporeal phenomena. If the soul is to be everlasting then it dies with the body and arises again with it on the day of the Last Judgement, this possibility being not a manifestation of nature but the result of God's grace and power. For Hobbes man was a machine in an exclusively material world whose actions were determined by mechanical laws. All that existed, including humanity and its mental capacity, was comprised of particles in motion (Rosenthal, 2000). Mental events were governed by the same causal laws as other objects since they could not claim a radically distinctive ground. Emotion and thought emerged as responses to external events. Sense impressions that lasted constituted ideas that could later be recollected through the faculty of memory (Porter, 2003). Man was a *machina carnis* that was furthermore an aggressive loner, a *homo lupo lumus*, an anti-social ego for whom the order of society against all odds offered a temporary remedy to its intrinsic solitary, cruel and nasty existence (Porter, 2003; Stenner, 2004).

In contrast to Hobbes, John Locke (1632-1704) argued that it was consciousness and not the body that determined identity (Porter, 2003). Selfhood was disembodied; the same consciousness in a different body would still give rise to the same person. In his scheme, as with Descartes, the self was a 'conscious, thinking thing' (p. 62); identity was maintained through the continuity of consciousness and not through the body which was regarded as a changeable physicality. Rather than being extended through the flesh, the self was maintained through the thread of consciousness assisted by the faculty of memory. Since consciousness was discontinuous, interrupted by states such as sleep, this meant that the self was discontinuous. Essential therefore in the maintenance of a consistent self was memory, the product of a lifetime of experiences and associations. In contrast to Hobbes' wretched mechanical beast, Locke offered a person born a *tabula rasa*, a blank slate to be constituted as a person through piecemeal acquisitions from experience and education. Locke's person was not an *a priori* mean machine but a mind infinitely malleable. All were born equal; the neonate mind was plastic and indeterminate, making good education essential and the emerging adult a contingent product.

It should be noted that for both empiricism, as in the work of Locke, and rationalism, as typified by Descartes' writing, the body functioned as an object; it was an observable, material entity like any other object in the world. For rationalism the divide between body and thought was extreme; there was the body-object and there was pure thought; Descartes' *res extensa* and *res cogitans*. Somehow the one could act on and thus influence the other and it was through the object of the body that the mind could have access to the world beyond. Where rationalism pursued a pure interiority, the perceiving subject, empiricism was enamoured with the achievement of a pure exteriority of objects. The body was an object like all others, rendered understandable through the logic of mechanics and causality (Cullen, 1994; Grosz, 1994b).

Benedict[2] de Spinoza (1632-1677) conceptualised the relationship between the mind and body differently. For him 'the mind and the body, are one and the same individual which at

[2] Given the Portuguese name Bento at birth and referred to by the Jewish name Baruch in the synagogue, de Spinoza took the Latin name Benedictus at the age of 24 after being excommunicated from the synagogue for his ideas (Damasio, 2003).

one time is considered under the attribute of thought, and at another under that of extension' (de Spinoza, 2000, p. 40). Mind and body were 'modifications' of a single substance; considered in one 'mode' the substance could be described in psychological terms, considered in another it could be described in physical terms (Rosenthal, 2000). Irrespective of these 'modifications', 'substance thinking and substance extended are one and the same substance' (de Spinoza, 2000, p. 36). For Spinoza the substance from which these attributes emerged was God or Nature, the one identical to the other (Damasio, 2003).

Mind and body were thus united, a union that however, for Spinoza (2000), could only be understood through adequately understanding the body. Famously the mind was conceived as an idea of the body (Rosenthal, 2000). However, this idea was identical to the body; 'the same thing expressed in two different ways' (de Spinoza, 2000, p. 36). The expression of an idea would also be the expression of extension, the two were inseparable (Rosenthal, 2000). Given the articulation of mind and body as identical and parallel, the problem of causality, the schism in Descartes' scheme, was circumvented. There was no distinction since as an expression of the same substance, thought was simultaneously the expression of extension. Neither mind nor body are prior and thus there is no need for causality. Consequently, if the body was not affected by another external body then the mind would also not be affected; a mental event was always an extended event (de Spinoza, 2000). Given this intimate union with the body, the mind perished with the body, although the mind as an essence, a concept, was eternal (Damasio, 2003).

For Spinoza the body was a chunk of Nature, composed of parts of different consistencies that varied in their responsiveness to external objects (Damasio, 2003). Such external objects could leave impressions on the human body which, in itself, was able to move such objects in an array of ways. Impressions were not always favourable and the body could be deformed by external objects. The body was perishable and the component parts had to continuously be made anew. The body was thus productive, in a continuous process of self-constitution, allowing for emergence of a dynamic level of constancy and identity (Grosz, 1994b). This identity emerged from the conjunction of the body's own organisation and the impressions of external objects, allowing for bodies to be understood

as ‘historical, social, cultural weavings of biology’; as complex contingent products (Grosz, 1994b, p. 12).

The contingency of the body as extension would of course be expressed in the mind as the other attribute of substance (Grosz, 1994b). The variety and degree to which the body could be ‘impressed’ determined the diversity of perceptions the mind was capable of, including perceptions of the flesh itself and those provided by the senses (Damasio, 2003). The loss of the body would mean the loss of the mind since the latter was dependent on the former for its ‘modifications’. The mind could however extend beyond immediate modifications to have ideas about them; that is, it was capable of reflection on the ‘impressions’ with which it was stirred.

In this manner Spinoza managed to articulate the mind/body as an active substance and a contingent product, freed from radical duality. For Grosz (1994b, p. 13), Spinoza’s body, ‘fundamentally nonmechanistic, nondualistic and antiessentialist’, was however not without its concerns. She indicates that Spinoza’s commitment to an integrated and holistic body excludes the possibility for bodies to fragment and fracture their gestalts, a process that often has surprising and liberating results. The concern with coherence emerges in neuroscience as well as will become apparent in later chapters. For now we will consider the splinterings of the mind and body through the emergence of idealism and materialism in the 18th and 19th centuries.

Immanuel Kant (1724-1804) declined to read Spinoza (Damasio, 2003). Instead, in his writing, Cartesian dualism reaches a new level of articulation; the Aristotelian soul was retained albeit now with the faculties of knowledge, desire and feeling (Want & Klimowski, 1996). These three faculties would form the foundation of Kant’s works of critical philosophy. The Aristotelian distinction between form and matter was taken up in the way the perceiving mind through reason imposes form or meaning on matter (Cullen, 1994; Staten, 1984). Kant identified *a priori* forms of time, space, causality and substance that the mind brought to bear on the world so as to structure it (Blackburn, 1994). In this way the world-as-experienced, the phenomenal world, was constituted, to be distinguished

from the noumenal world; the world of things-in-themselves, things as they really are. This latter world would remain unknowable; we have to remain completely ignorant of that upon which we do not bring to bear our universal *a priori* judgements (Kemerling, 2006).

Although the body retained its machine status and the repression of corporeality in philosophy was further institutionalised in his work (Saul, 1999), Kant's body both enabled and restricted the limits of the soul's ability to know and act on the world. Carpenter (n.d.) identifies two notions concerning the body in Kant's pre-critical work. In the first, which he would later abandon, Kant located the soul, the spirituous matter, in the space occupied by the body. This intermingling of the spiritual substance with matter served to organize the latter. With the second notion, which lasted well into his later work, he identified the soul's dependence on the body; the human soul could only represent the world because it can be affected by the body. The body was indispensable for thought; it was therefore not a prison as in Plato's scheme but an enabling substance. This did not imply that it was not also an impediment to thought; it was an extended substance whose density was determined by the location of the earth relative to the sun. Drawing from Newtonian science Kant identified the forces of attraction and repulsion as decisive in establishing the nimbleness of earthly matter. This had direct consequences for the subtlety with which representations were offered to the soul and the range of cognitive actions with which it could respond to the world. Cognitive subtlety was thus constrained by our planetary lot and by the maturation and aging of the body. But it is not without hope. The body could be trained; its fibres could be 'unbended', to allow for improved cognition (Carpenter, n.d., p. 6). Without such discipline the body tended towards passivity, a condition where thought became determined by the senses and declined into an animalistic status. The soul was necessarily engaged with the body so as to be in the world and could, through the exercise of will, introduce, within limits, a degree of agility into the body's gross and clumsy matter. This then allowed for the emergence of the soul's gifts. The Kantian body was therefore not a simple substance; it was not fallen, unnecessary or static. It was body determined by its cosmological context, a substance that matures, was fallible to aging, essential for thought, and malleable. With the right training the body could be disciplined in such a way as allow the soul to fully express itself.

For Georg Hegel (1770-1831), Kant's distinction between the noumenal and phenomenal was problematic as it then left 'things' in the world untouched by the mind (Marcuse, 1999). He was concerned with Kant's first-person individualistic synthesising position which positioned the social with the natural as external object (Hund, 1998). Instead, for Hegel, the world has a unity free of individual synthesis and with which we can co-constitutively engage. He worked to address this gulf between the subject and social through the specification of a dialectical logic which described a universal process through which the potential of all things eventually came to the fulfilment of its 'notion' via a process of 'sublation' (*Aufhebung*), the overcoming of inherent oppositions or contradictions (Spencer & Krauze, 1996). In this way Hegel could describe the development of substance, from that which passively fulfils its potential to that which eventually reaches a conscious and, most importantly, self-conscious state (Marcuse, 1999). Often accused of excluding language and the body from his system of thought, Russon (1993) argues that both were 'absolutely central' in Hegel's work (p. 1). It was through the historical transformation of the body from an unconscious life-support system to one that was able to both express itself and read the body of the other (i.e., a body that communicates) that, for Hegel, the social was enabled, and the individual ego became a self-conscious entity embodied in social institutions.

A duality persists in Hegel's system where the self as free will was distinguished from the self as an individual and natural body (Ciavatta, 2005). As with Descartes and Kant, the body here acted as a bridge; it was a feeling body that puts the mind in contact with external things. Consequently the body was not merely a thing amongst other things in the world but the body belonged to the mind in a way other things did not; it was a necessary medium, a concrete subject, a soul-endowed instrument of the mind. The relationship between the Hegel's *Geist* (spirit or mind) and the body was not simple; their development entwined. It was only through the transformation of the desiring and needing body to one which was the organ of the will that the development of the spirit was itself enabled. It was the body in its 'external existence' which allowed the emergence of other modes of existence (Ciavatta, 2005, p. 12). The expression of the spirit, the will – contra Kant - was

not pre-formed awaiting the transformation of the body to allow its latent expression, but was itself actualised through the growing sophistication of the body's abilities. Through the development of the body's 'determinate characteristics', which enabled an experiential diversity, the mind was allowed to engage with the world with a greater degree of freedom (p. 3). The development of the body's powers through engaging with the particularities of its external world, transformed it in a way that allowed greater freedom or expression of the will. One became 'one's own person' through taking ownership of one's body, through a mutual process of transformation and actualisation.

The body for Marx and Nietzsche

As a Lutheran and idealist, Hegel considered nature and history as the expression of the Absolute Idea (Slaughter, 1985). Historical process and nature are thus imbued with the texture of thought; representative of the dialectical process in which reality unfolds in a progressive trajectory. As an atheist and materialist, Karl Marx (1818-1883) secularised Hegel's dialectics and regarded it as unfolding through matter; a dialectical and historical materialism (Younkins, 1998). Regarding religion as the expression of a need in an exploitative world, the soul loses its ontological status and takes on the status of a symptom (Slaughter, 1985). Following from this materialist position the mind became the product of sophisticated matter. Matter was thus primary and thought, which emerged from the activity of the brain, emerged as a reflection on the person's material circumstances. Nature provided us with sense perceptions constituting appearances from which knowledge about the world could be abstracted. But this sensuous capacity of the body was not to be regarded as a passive and contemplative activity; the senses, as with the rest of the body, was practically oriented to the world; the aim was to survive within this environment. Marx substituted the subject-object dichotomy with his notion of 'practico-sensuous activity', this being 'a simultaneously subjective and objective continuum of mutually transformative interaction' (Turner, 1994, p. 36). In developing his materialist theory, Marx emphasised that it should be a materialism that does not abandon the active nature of humans that idealism had mistakenly attributed to consciousness (Bourdieu, 2004). We act on the world and through this process of engagement we mutually transform the world and ourselves (Slaughter, 1985). The body and its thought are shaped by the environment in

which it exists as it simultaneously shapes that world to suit its needs. The body is comprised of biologically inherited capacities that allow for a productive and creative body that can utilise tools so as to act on the world. In this way humanity is liberated from a complete reliance on the unpredictability of biological mutation.

The parameters of Marx's body are extensive. In an attempt to indicate the absolute reliance of humanity on the environment, he stated that 'Nature is man's inorganic body' (Marx, cited in Turner, 1994, p. 27). In order to survive the interchange between the organic and inorganic bodies had to be sustained. Society emerges as a means through which such survival is enabled (Slaughter, 1985). The body is thus contingent not only on the natural world it finds itself in but also on the social structure that surrounds it (Harvey, 2000). Of course, the society that captures Marx's interest is one where capitalism is dominant, and where the circulation and accumulation of capital, in the interest of those who own the means of production, has a profound effect on the body. Having a body with the capacity for labour, the labourer exchanges this power for money so as to obtain commodities that enable it to survive and retain its productive capacity. It is then a physically needy body which has to produce so as to survive. As an 'unfinished project', that is, a malleable and open substance, the body is shaped by capital so as to meet its needs (Harvey, 2000, p. 98). Capital has to mobilise the body and all its characteristics (emotions, drives and capacities) for its purposes. These purposes often place contradictory demands on the labourer; such as to be educated yet uncritical, obedient yet creative, and to labour in unhealthy conditions and yet remain healthy. It is thus a remarkable body that has to be disciplined to fulfil the myriad of ever changing demands made on the labour force.

It is not only within the realm of production that capital disciplines the body, but its control extends throughout the entire cycle of the flow of capital. Particular bodies are sculpted in the process of exchange, consumption and reproduction (Harvey, 2000). By impacting on the labour process, including labour markets and consumer desires, the experiential world, that of subjectivity and consciousness, is affected in addition to the physicality of the body. Capital hones in on the needs, wants, desires, and relations of the ever open and shifting body so as to incorporate these within its logic. Just as it discovered and reinvented the

labouring capacities of the body, ultimately violating and maiming the body's integrity through its desire for surplus value, so capital targets the needs and pleasures of the body. There was nothing essential about the body's desires, these emerge from a context marked by 'history, geography, culture and tradition' (Harvey, 2000, p. 105). With Marx the soul flickers out whilst the mind and body emerge through a dialectical and transformative relationship with the environment. The metaphysical and incorporeal fantasies of the past are treated as ideological suspects as the body and its materially-grounded consciousness are inseparably linked to society and its exploitative class structure.

Echoing this assault on the metaphysics of the past, Friedrich Nietzsche (1844-1900) opposed spiritual idealism and mechanical materialism. In fact, the entire philosophical project was held to account for disavowing the body as an origin and a site for knowledge. Its claims to truth were to be treated with abhorrence and seen as practices that aimed to achieve particular ends (Grosz, 1994b). Truth was but a legion of metaphors resulting from the will to power; the active, energising force that sought more than survival but also continuous expansion and becoming. Philosophy as a will to ignorance had only succeeded in misrepresenting bodily passions and energies as phenomena of the mind. It had failed to recognise that knowledge was the product of particular bodily forces. Its primary tool, language, had only served as a cloak which had assisted in the false naming of nature (Blondel, 1991). Language provided no ontological correspondence but was rather a range of sounds for the relations between things. Ultimately it too was in the service of physiological functions. A better philosophy would recognise that all we have are perspectives, positions and interpretations of the world and the body (Grosz, 1994b). Reduced to the figurative, language must be cast into play so as to produce a plurality of metaphors that allows for multiple perspectives that support the expression of the body and the will to power (Blondel, 1991). This was Nietzsche's ultimate epistemological principal for which the body would be the primary ontology.

Although never providing a coherent account of the body, Nietzsche's references to it are abundant (Grosz, 1994b). For him 'the body is a more astonishing idea than the soul' (Nietzsche, cited in Turner, 1994). He posited a monism where consciousness was

secondary to the body and emerged from its forces (Blondel, 1991). The 'body am I entirely and nothing else; and soul is only a word for something about the body' (Nietzsche, cited in Grosz, 1994b, p. 127). Consciousness in Nietzsche's schema was regarded as incomplete, not essential, something that thought by accident (Blondel, 1991). It, equated with the intellect, interpreted the plurality of the body, simplifying and unifying this multitude, and ultimately provided a commentary on that which remained unknown and obscure to it. Consciousness was but a blind instrument of the body's forces; energies which remained hidden and unconscious. Although clearly located as a far second and unnecessary, Nietzsche at times regarded the intellect as imposing a regularity which did allow for the satisfaction of practical needs. But ultimately it remained a symptom of an animal which has strayed from its course; humanity was a lost and failed species and the event of consciousness had weakened its instincts.

It was these instincts, also referred to as drives, forces, affects and energies, which interpreted the chaotic nature of the world, the site of the greatest possible multiplicity (Blondel, 1991). Nietzsche's body was an interpreting body, which instated a simpler plurality on the chaos in which it found itself. It was through this bodily interpretation that reality was constituted. Each one of this multiplicity of forces interpreted the world in its own way, forming a particular perspective. The forces tussled with each other for dominance and remained in continuous and dynamic struggle. Consciousness then became the expression of a particular drive and its reality as this gained dominance and imposed its intellect. The malleability of the body was profound for Nietzsche since the forces that made up the body were diverse, infinite, pliable and fluid (Grosz, 1994b). They could be distinguished into broad types; active and reactive, noble and base. Active forces were dominant, self-obsessed, mobile, transformative, establishing difference and the pleasure of expression. Reactive forces were subordinate, adaptive and restrictive of the will of the active energies. It is here where consciousness emerged for Nietzsche; through the inhibitory action of the reactive forces, outward charges were subdued and, turning inward, a psychical interior emerged. This same dynamic of outward force and restrictive conservation was captured in the latter set of distinctions; the noble impulse pushed

forward forgetful of what has been, whilst the base or slave impulse was tied up in the past, unwilling to push beyond.

Given his epistemological position, the body for Nietzsche could only be understood through the use of metaphor, although he did at times seem to posit a pre-conceptual foundation where bodily metaphors were somehow closer to the empirical world (Blondel, 1991). As shown above, several metaphors for the body emerged with regularity; the body as digestive system; assimilating and eliminating aspects of the world; the body as political organisation, marked by a multiplicity struggling for dominance; and the body as interpreter, reducing chaos to allow temporary mastery. These metaphors also then provided ways of understanding culture and society as assimilations, unstable forces and interpretations. The body, approached through metaphor, in turn acted as the ground for consciousness, knowledge and culture (Blondel, 1991; Turner, 1994). The ground for social relations emerged from the body's propensity to experience pain and pleasure (Grosz, 1994b). Pain formed the basis on which exchange became possible in society; they who could not repay their debts were to be punished for this; their physical pain providing repayment in the form of the pleasure of cruelty. This punishing and disciplining of the body still forms the foundation of contemporary 'humanist' society, as we shall see in the work of Michel Foucault discussed in the next chapter.

The body and psychoanalysis

Psychoanalytic theories and notions, specifically those developed by Sigmund Freud (1856-1939) and Jacques Lacan (1901-1981), continue to be popular amongst critical psychologists. This is found specifically in the theorising of subjectivity, where, according to Cromby (2004), desire is articulated as the result of metaphorical (i.e., poorly materially instantiated) processes or as that which escapes the symbolic (i.e., linguistic articulation). He argues that such conceptualisations continue to marginalise the specificities of the body in that the somatic is positioned as an auxiliary surface for psychic or linguistic processes. This is debatable. Here I will briefly and broadly consider the relationship between the soma and psyche (body and mind) in the work of Freud and Lacan.

As illustrated by early studies of conversion hysteria and its somatic symptoms, the body has been central to psychoanalysis since its beginnings (Wilson, 2004). These explorations demonstrated the entwined nature of the soma, psyche and social, as well as revealing a biology of remarkable expressive and transgressive malleability. Yet, in later years, Freud (and the majority of those that have engaged with his work since) considered biological preoccupations as distractions from psychoanalysis. This despite his reliance on evolutionary biology as demonstrated in his later sociological writing (Sulloway, 1979). For Wilson (1998), Freud's *Project for a scientific psychology*, written and abandoned in 1895, is the most vivid display of his ambivalence regarding the relationship between neurology and the psyche. Emerging at the start of the period (1895-1900) which Freud identified as the birth phase of psychoanalysis it is regarded by some as his last venture before his 'radical break' from his career as neurologist and his final embrace of psychology (Sulloway, 1979). Wilson (1998) argues that the chronology does not run this smoothly and that the pursuit for a link between biology and psychology was never fully abandoned by Freud. This chronic ambivalence in his work has led to attempts, such as those by Sulloway (1979), to depict Freud as a crypto-biologist or, as with Derrida (2001), as him engaging in deluded struggles with neural fictions. The relationship however appears to be more complex than indicated by such proposals.

Grosz (1994b) identifies in Freud's later work the articulation of a significant connection between the morphologies of soma and psyche, placing the body in an intimate relationship with the mind where the one implies the other. As much as the ego brings unity to perception, it is the perceptual surface of the body which is its origin. The ego, concerned with managing the demands of the id within the context of social reality, emerges through a set of identifications with other subjects, forming the ego ideal, as well as a concomitant set of prioritisations (libidinal attachments) of body parts. The conjunction of these two processes gives rise to a meaningful body, one that is more than just another object in the world. The ego's morphology arises from a psychical map of corporeal intensities contingent on social experiences and so is not simply a set of direct anatomical associations. These intensities are also not arbitrary but privilege those body parts most exposed to social contact and attention, this consequently privileging the skin and orifices.

The ego is accordingly a depiction of the body as it is significant to the other; hence the social, psyche and soma are entwined.

Solms and Saling (1990) in considering two late neurological papers written by Freud in 1888 argue that his position at that time regarding the mind/body binary was closest to that of parallelism or non-reductive materialism, and that Freud clearly was not reducing the psyche to an epiphenomenon, or implying a causal relationship between two distinct substances, or suggesting the simple isomorphic conflation (reduction) of an identity theory. Not to be confused with Spinoza's parallelism, they here define psycho-physical parallelism as dualistic in that it implies two distinct domains which resist a reduction of one to the other this then justifying the distinct disciplines of neurology and psychology. However there remains an intimate correlation (not causality) between the mental and physical where mental states arise *with* physical activity.

Wilson (1998) and Grosz (1994b) both argue that Freud's position is best left as a dilemma; undecidable. Wilson states that in the *Project* Freud retains the neurological as essential for the constitution of the psyche but that he refuses a static and topographic depiction of function by theorising a neural process marked by difference and deferral. In her reading of his early studies on neurasthenia Wilson (2004) illustrates how these undermine charges of neurological (or cultural) determinism or reductionism in that the identity of the elements that comprise a system, which includes both the soma and psyche, emerge through an intimate process of mutual co-constitution. This then troubles attempts to clearly divide neurology from psychology, suggesting this as the source of the ambivalence that haunts Freud's work. For Grosz (1994b), it is Freud's notion of drive that troubles any dualistic logic in his theorising as it lies irreducibly betwixt mind and body, the psychological and the neurological. Central here is his distinction between instinct and drive, where the former is placed with the biological, the universal of living beings, and the survival needs of life. Instincts are however not fixed or complete but malleable or lacking and thus open to 'psychosymbolic takeover, in which they are retraced, taken over, as sexualised drives' (Grosz, 1994b, p. 53). In this process of social usurpation the functional becomes sensual, need becomes desire, animal becomes human, and certain body parts become erotogenic

zones. The social in all of its discriminatory and ideological realness is thus inscribed or imposed on the incompleteness of the biological 'at the anatomical, physiological and neurological levels', instantiating a deeply material intimacy with the social which brings the biological to completion (Grosz, 1994b, p. 60). Of significance is that there is no pure or complete biological body, including sexual difference, pre-existing this process, a point which Lacan picks up on.

Lacan concurs with Freud's theory; the ego is concerned with an 'imaginary anatomy' (Grosz, 1994b). It is constituted as a unity by the child perceiving its own image in the mirror or by observing the co-ordinated actions of others in its world. The infant, then less than a year old, starts to behave as though it is a whole being, a *Gestalt*, rather than an organism comprised of a disparate set of sensory and motor processes. A rudimentary sense of the boundaries of the body and self are thus established. For Lacan there is then no 'body' as such prior to these interactive processes. Soler (1995) points out that the body being a product of organism plus image is thus secondary. The primary body for Lacan is language. Therefore a significant development subsequent to the unification and spatiality of the imaginary is the child's entrance into the socio-cultural space through the symbolic order, where the subject, the 'I' of discourse, emerges. The body in Lacan's work is therefore overwritten by language. In this process the body again becomes fragmented (through the identification of body parts, 'organs', in discourse) and is considered devitalised, emptied of jouissance. As Fink (1995) states, it is subdued and subordinated, the organism dies in this process. Furthermore, the subject is considered to be divided from the soma in that discourse precedes and survives the body of the individual (Soler, 1995). The consequence of this loss, this mortification of the body through the effect of the signifier, is libido or desire, a push towards the other in search of plenitude, the full jouissance of the body. Thus a failure to enter the symbolic order, as happens in psychosis, implies that no body emerges and that no agency is possible.

To return to the opening comments by Cromby (2004), we can say that he is correct to some extent. Soler (1995) points out that psychoanalysis has not brought new knowledge to bear about the biological body; its concern is not with the particularities of this body.

Lacan's theories and metaphors leave the body to one side, the processes of the imaginary and symbolic are less an occupation than the comprehensive colonisation of corporeality, where the biological does not have to be addressed except generally as a vitality lost and thereafter forever unsuccessfully sought. In Freud's case the situation is less clear; across his career and, particularly, in his notion of drive the relationship between the biological and psychological remains in play and, as will become clearer in Chapter 8, the specificities of neurology remain vital to psychoanalysis' radicality. As Wilson (2004) argues, for the early Freud at least it was the details of neurological materiality that invigorated his critique and theorising.

The body's others and the others' body

As will continue to become apparent in the next chapter, the notions of *pneuma* and *psuchē* exemplify ongoing concerns in the theorising of the body; that of the nature and origin of corporeality's vitality and the character and limits of its morphology. The locus of the body's animation, its livingness, slips endlessly inside and outside of its boundaries. The life force oscillates between corporeality and its others. From the puppetry of the gods to the dynamic balance of the humours, from the status of a tomb to the origin of unreason, from the passivity of a determinist machine to a field comprised of the tussle of forces, across this history the status of the *pneuma* remains at play. Lakoff and Johnson (1999) argue that the most constant characterisation of the body across history is of being secondary to some greater other, usually in the form of an immaterial soul or mind. This relegates the body to the status of a passive or inert substance, the vitalising force coming from elsewhere.

Entwined with the problem of the body's animation is the question of what makes the body what it is, what is its essence or form? In the contrast between Plato's transcendental Forms and Aristotle's co-constitution of identity by form and matter we can discern the longstanding themes of dualism and monism. The abstraction of the soul with its consequent reification, its misrecognition as a thing, is enwrapped with the ascription of psychological, internal and moral dimensions. Plato's notion of Form displaced the physical world as poor imitation, whilst the soul transcends the mortality of the corporeal in

Christianity, leaving the latter's status up for debate in terms of its innocence. The soul's secularisation as mind casts the body as machine, clearly needing external animation. Attempts to save the corporeal from this determinist dominance results in a mind divided from the world, as with Descartes' and, later, Kant's conceptualisations. The conflation of mind and consciousness in Descartes and Locke streamlines the notion evoking an old theme where the passions are the domain of the ill-disciplined body. This cogito-centrism is then cast aside in the work of Marx, Nietzsche and Freud, consciousness becoming a product of other processes, those of survival, the unconscious and repression. Attempts are made throughout to escape the binary and ground us in materiality, as seen in the ethereal substances of Democritus and Epicurus and, later, the mechanics of Hobbes' wretched beast. Aside from the immortal aspect of the rational soul, Aristotle avoids the division of our being into two entities, Spinoza circumscribes this trap through the positing of two dimensions, Marx wraps us up in an intimate relationship with the environment, whilst Nietzsche grounds a new spirituality in the soma, a dynamics later exploited by Freud.

In both Plato and Aristotle there is also the struggle to distinguish essence from accident, being from formlessness, the order (economy) of form from the indefiniteness (aneconomic) of matter (Staten, 1984). From these Post-Socratic Greeks onward, flux is positioned as philosophy's enemy. The identification of the universal, the fixed and the enduring is however a troubled task; the body asserts itself tirelessly as a malleable and open entity. The accidental continuously threatens the integrity of form. Cast as the other of soul and reason the nefarious body threatens to undo the timeless; the Stoics thus believed that corporeality must be disciplined and bought under the control of reason. This capacity for alteration becomes more overt as a positive force with the rise of modernity; Kant felt that the body could be softened to the needs of the subject, for Hegel the will and body emerged through a dynamic and entwined unfolding, Marx's corporeality emerged through a intimate relationship with the environment, whilst Nietzsche's faith in its capacity for change seemed endless. As an unfinished product of biology, the body is exploited and occupied by the reinscription of the social in Freud's scheme, a process of colonisation that in Lacan's reading almost comprehensively erases the biological body.

As we will see in the next chapter, the identification with the body evident in these later philosophies did not guarantee the body prime place in the theoretical work of either mainstream or critical psychology in the late 20th century. For a substance that is so visible, so immediately present, theorists have been remarkable adept at erasing its presence from conceptual work. The above preoccupation with form and vitality becomes visible again as a search for centre and an ongoing struggle with dualism in the next section which considers the status of the nervous system across history more directly.

THE PHYSICAL MIND: NEUROSCIENCE AND THE BODY

Hearts, ventricles, glands and cortices

The previous section placed the body (and its others) in a historical and conceptual context tracing a line from Ancient Greece up to and including psychoanalysis in Europe in the twentieth century. Chapter 3 will take up the theme of the body again, tracing its conceptualisation specifically (although not exclusively) within the disciplinary confines of mainstream and critical psychology, this providing a more detailed articulation and justification of the objectives indicated in Chapter 1. The second section of this chapter alters the trajectory pursued thus far (although extending the neurological theme introduced in the discussion on psychoanalysis) by providing a historical overview of the relationship between the notions of brain and mind. This then provides a chronological context within which to understand the neuroscience texts deconstructed across chapters five to seven in the '(Mis)readings' section.

Disparate claims concerning the 'controlling body part' are identifiable amongst the Pre-Socratic Greeks with the heart and brain identified as the main candidates (Kolb & Whishaw, 1996). Plato placed the rational soul in the brain since this was the organ closest to the heavens, whilst Aristotle identified the heart as the central sensory organ. For him it performed the unifying function of the various sense-faculties, producing the 'sensus communis' (Bennett & Hacker, 2003, p. 17). The brain with its convoluted surface was considered by him to be involved in temperature regulation (Kolb & Whishaw, 1996). Hippocrates differed from Aristotle, identifying the brain not only with the senses but also

with the passions and judgement (Bennett & Hacker, 2003). Either way what emerges here is the notion of an integrative function, one that brings disparate aspects of sensory experience together, a role now generically attributed to the nervous system.

The notion of *pneuma* (breath) was considered by Aristotle as a divine element, a 'vital heat', which was converted by the heart to *vital pneuma* that allowed movement (Aristotle in Bennett & Hacker, 2003, p. 18). Much later Galen linked the nerves, discovered by Hierophilus centuries earlier, to muscle contraction. He distinguished between sensory and motor nerves with only the former being linked to the brain, the latter to the spinal cord. Galen then postulated that vital pneuma was converted to *psychic pneuma* in the brain which played a role in muscle contraction via the nerves. Given this emphasis on fluid the mental functions were associated with the ventricles, this initiating the ventricular doctrine. The heart was dispatched as the controlling organ and the ventricles enjoyed dominance for the next thousand years. Only in the 16th century does Vesalius (1514-1564) question this doctrine on the basis that inter-species uniformity in ventricle morphology makes it hard to explain the unique functions of human beings.

Shortly after Galen, Nemesius (c. 390), a Christian interested in Plato's philosophy, linked a variety of mental functions to different ventricles, this instantiating the process of brain localisation. Bennett and Hacker (2003) link Nemesius with a different conceptualisation of the soul (*psuchē*) than used by Aristotle. Aristotle's corporeal form here becomes a pre-existing, indestructible and distinct stuff which becomes the site of perception and cognition. Importantly capacities associated by Aristotle with the entire organism are now located in a (neural) part of its being. Bennett and Hacker refer to this as an idea which 'runs like a canker through the history of neuroscience till this day' (p. 22).

Jean Fernel (1495-1558) is attributed by Bennett and Hacker (2003, p. 23) with the 'first formal treatment of physiology'. He distinguished the 'where' of anatomy from the 'what' of physiology, but continued the 'confused tradition' of the notion of a distinct soul, a reified and immaterial intellect which inhabits and uses the body (p. 24). He does however identify acts that are outside of the will or intent of the soul; the reflexes. Fernel's core

text, *Physiologia*, would remain a dominant influence in the field for a century, slipping from vogue as mechanistic notions became the dominant explanatory schema for the world. As previously discussed, Descartes instantiated an ontological dualism where the body, the *res extensa*, is considered to be a complex machine. For neuroscience Descartes' effect is profound: By locating the interactional site of the mind within the firmer materiality of the pineal gland the ventricular doctrine is dethroned. In addition, equating the mental with consciousness, establishes an equation that, as we will see in the discussions of Damasio, Goldberg and LeDoux, has taken a long time to trouble. Also the *psychic pneuma* is replaced by the clearly material notion of 'animal spirits'. With the rise to power of Descartes' dualism the identity of neuroscience is pre-defined as that which must articulate the *relationship* (the interaction) between the singular mind and the *machina carnis*.

Thomas Willis (1621-1675) moved the location of the psychological attributes to the cortex (Bennett & Hacker, 2003). For him, the cortex constituted an arc from sensation to movement by means of the animal spirits. This arc is however purely reflexive, volition still being ascribed to the immortal rational soul. As with Descartes the external world would then have to be represented internally for the soul to have perception. The spinal reflex as well was not without its invasion of metaphysical explanation, that of the 'spinal soul'. This notion is only dispatched much later, in the early 19th century, by Bell and Magendie's explanation of the spinal cord reflex that functions independently of the brain and, later, Charles Sherrington's (1857-1952) account of locomotion.

Luigi Galvani (1737-1798) demonstrated the electrical nature of nerve conduction, this challenging the notion of animal spirits and the associated hydraulic models that had retained their dominance till the late 18th century (Bennett & Hacker, 2003). Much later, in 1886, Bernstein proposed that nerve membranes are polarised enabling action potentials, the details of ionic conduction only being clarified by Hodgkin and Huxley in the mid 20th century (Kolb & Whishaw, 1996). Nerve structure was clarified in the late 18th century with the development of staining techniques. Debate raged about whether the nervous system was constituted of independent units or whether it had a net-like structure. Santiago y Cajal (1852-1934) put this to rest when his staining technique revealed independent units,

although it was later found that some neurons, though distinct, are in direct electrical communication with each other this comprising a web-like formation (LeDoux, 2002). Sherrington suggested that neurons are connected across small gaps or junctions that he referred to as 'synapses', this later being confirmed via electron microscope studies (Kolb & Whishaw, 1996). In 1949, Donald Hebb (1904-1985) proposed that neurons active at the same time strengthen their synaptic connections with each other, this establishing a physical model for the establishment of functional units and functions such as memory.

A debate emerged in the 19th century concerning the organisation of the cortex: Pierre Flourens (1794-1867) argued that it acted as a whole specialised only for the higher functions such as reason, and Friedrich Goltz (1834-1902), drawing on decortication studies, suggested that the cortex' role in functions was negligible (Kolb & Whishaw, 1996). However, Bouillaud, Broca, Dax, Fritsch, Grunbaum, Hitzig, Horsley and Sherrington mostly independently produced evidence for the functional specialisation of parts of the cortex, predominantly speech and other motor actions (Kolb & Whishaw, 1996). The reactionary notion of strict localisation, echoing the ideas of Gall and Spurzheim's phrenology of the early 19th century, was subsequently tempered by Carl Wernicke's (1848-1904) evidence of multiple areas involved in specific functions where the disconnection between these areas could also have consequence. Alexandre Luria (1902-1970) argued that the notion of functional centres was misleading and that instead the various components that comprise a function needed to be explored in terms of specific contribution (Solms & Turnbull, 2002). John Hughlings-Jackson (1835-1911) offered a hierarchical model of cortical organisation aligning the cortex with purposeful behaviour and the sub-cortex with more elementary aspects of functions (Kolb & Whishaw, 1996). He also speculated that the motor cortex represented the body in a somatotopic fashion, a notion later confirmed by David Ferrier (1843-1928) (Bennett & Hacker, 2003).

Throughout all of these developments the notion of the 'cortical soul' however remained an accepted idea amongst many prominent neuroscientists (Bennett & Hacker, 2003). Sherrington drew a Cartesian distinction between energy and mind whilst his successors, Edgar Adrian (1889-1977), John Eccles (1903-1997) and Walter Penfield (1891-1976), all

independently reiterated the same set of relations. Thus the notion of the separation of two entities kept in place the question as to how such distinct substances could interact. Throughout the notion that the mind is intimately associated with the brain was retained. For Penfield the body remained an automaton, now understood as a sophisticated computer. He argued than rather than the mind being a function of the brain, the mind interacted (or had its point of contact) with the brain through its 'highest brain mechanism', which acted as the mind's executive (p. 61). This highest point, the 'psychophysical frontier', was distinguished from the cortical sensorimotor system and, controversially, referred to centrencephalic integrating system (CIS), the neurons running from the medulla through the thalamus and connecting the two cerebral hemispheres (Levin, 1960).

We can trace two interrelated themes across the above history. The first is the concern with the point of integrative centrality. At first this travels in gross movements from the heart to the brain, instantiating the dominance of the (central) nervous system which continues to remain unchallenged till this day. Then it moves more subtly within these parameters to the ventricles, the pineal gland and onto the cortex. Even then it remains contested as we see in Penfield's brainstem claims referred to above. Currently, as will become apparent in the discussions of the contemporary texts of Damasio and Goldberg[3], the emphasis is on the cortices' prefrontal lobes. But even now, as we find in the chapter on LeDoux and his emphasis in the subcortical emotion systems, a tension remains. This concern with a point of centrality, a space of highest integration, will be addressed repeatedly in the chapters that comprise the '(Mis)readings' section. The second theme is the concern with the meeting place of the metaphysical mind and the material body, which shifts along with the identified location of the point of centrality. The mind/body debate as it currently stands in neuroscience is addressed in the closing part of this section.

Dualisms and monisms

A number of dualisms and monisms may be identified that still circulate in contemporary discourse. Within present-day secular neuroscience earnest attempts are made to dispatch the notion of a transcorporeal mind (Damasio, 1994). Strongly countered is *interactionism*,

[3] As discussed in Chapters 5 and 6 respectively. LeDoux's text is addressed in Chapter 7.

which proposes two radically distinct substances that stand in a causal relationship to one another which, as we have seen in the discussion on Cartesianism in the opening section, raises irresolvable relational problems. The alternate, what Solms and Turnbull (2002) call *psychophysical parallelism*, replaces the causal relationship with that of a correlation but retains a relational problem through a continued lateral distinction between two substances.

A popular response to these dualistic frameworks comes in the form of types of monist materialisms, where one substance, the physical, is regarded as more fundamental and the other is reduced to an aspect of the former. Harré (2002) distinguishes between three forms of materialism that are all attempted reductions of psychological phenomena to the subject matter of particular disciplines. In *physicalism,* attempts are made to account for psychological phenomena through reference to processes and concepts associated with physics, in *neural materialism* the aim is to reduce psychology to neurology, whilst with *ethological materialism*, psychology forms part of evolutionary theory. With the exception of the latter, the focus of study is on the isolated individual in which cultural, social and political processes are excluded. With the third, the environment may be included but often in the form of a biological evolutionary theory that also excludes social notions. Neural materialism enjoys significant influence in contemporary neuroscience either, in its crassest earliest determinist form, reducing the mental to an epiphenomenon of neural process where the psychological enjoys no (or only the illusion of) agency or, more recently, where mental discourse is regarded as an antiquated remnant of folk psychologies. This form of neural reductionism is called eliminative materialism and given its popularity and the way it opens up discussion to other monist readings will be addressed here in some detail.

Empiricism, by which is meant the work of the British empiricists and, in the 20th century, the development of behaviourism in the United States of America, was driven by a reductionist and atomistic rationality. The world could be made intelligible by being fragmented into its constituent parts which could then be causally-related to one another (Spurling, 1977). As in the Enlightenment, the person is regarded as a sophisticated machine that springs to life due to the establishment of stimulus-response associations (Cullen, 1994). This model was characterised by a concern for objective observation which

has found contemporary expression in the form of *eliminative materialism* (Harré, 2002). Here success is indicated by the elimination of unobservable, or 'non-material', entities, such as feelings, pains and thoughts, from our everyday vocabulary. Churchland (1989) argues for such a replacement of psychological terms with physical terms. Thoughts and related mentalist expressions are regarded as the remnant of quaint folk psychologies (Matthews, 2004). The assumption is that such phenomena can only be understood as non-material, mental entities and are consequently outside the scope of intelligibility of a materially and causally invested science. To gain access to such a science, these processes need to be replaced by a particular materialist framework. For Churchland (1989) this materialism would consist of terms that refer only to objectively observable neural processes, what he calls 'completed neuroscience' (p. 1). So, for instance, I would not say that I am feeling down or depressed[4] but rather indicate that my body is currently in a state of serotonin depletion. Such a strategy thus aims to reduce all subjective language, language referring to mental entities, to, what I here call, *objective-physical discourse*. Such a discourse is constituted solely of objective terms. Phenomenological discourse (since Churchland cannot deny that we experience the world) or, what I here call, *subjective-physical discourse*[5], in this scheme is comprehensively colonised by the discourse of the scientific outsider. What is observed from the outside through objective scientific experiments is privileged over terms used to describe what makes up the inside[6]. To give an example used by Churchland (cited in Harré, 2002, p. 87); 'I am feeling pain' becomes 'the c-fibres of this body are firing'[7].

[4] Both terms already draw on spatial metaphors as Lakoff and Johnson (1999) note in their work which will be discussed in the next chapter.

[5] The term highlighting the physical nature of subjectivity is used in this way so as to counter slippages into metaphysical discourses.

[6] The use of the word 'describe' here serves a momentary purpose but is ultimately problematic since, as will become clearer in the next two chapters, language is not merely descriptive of our 'inner' states but constitutes these states in particular ways. As Churchland (1989) rightly notes, the terms we use have a social history; they emerge from amongst the 'folk'. What is problematic is that he places his 'scientific' brand of objective-physical discourse in an ahistorical position, as speaking the Truth of our states.

[7] The atomistic tendencies of such a strategy are revealed by this example. Kandel, Schwartz and Jessell (1991) point out, there are '[many] factors in addition to the level of activity of Aδ and C fibers [that] determine the location, intensity and quality of pain' (p. 474). To thus substitute pain with a reference to c-fibres would be a simplification of the phenomena and would do violence to the truthfulness of the objectively accurate scheme Churchland hopes to implement.

Several criticisms of such an approach have been raised. First, Matthews (2004) argues that eliminative materialism betrays a continued adherence to the Cartesian distinction between mind and body. The mental is equated with the non-physical and thus we either have to accept the existence of the non-material realm or we have to equate everything to observable brain processes. In this way the either/or binary logic of dualism stays in place. The tendency to equate the mental with the incorporeal has been noted in the previous section. What I would like to focus on here is the version of materiality that is being imposed. Churchland (1989) gives us only one alternative option if we want to escape the mystical incorporeal realm; the nervous system. He reduces materiality to neurology, that is, a *neural materialism*. All mentalist terms referring to the subjective realm must be replaced with neural discourse. It then seems that the morphology of the mind can only be accounted for by referral to this specific aspect of the body. This echoes the notion of the 17th century materialist, G. O. de La Mettrie, who maintained that 'studying the laws of the sequence of brain states must be enough to account for the character and sequence of mental states' (Harré, 2002, p. 91). Thus as much as the role of mental terms is excluded so is the possibility of referral to material and social processes outside of the parameters of the nervous system, which would not only include the environment but also all extra-neural aspects of the body.

Churchland (1989) implies that the morphology of the subjective is to be equated to the morphology of the nervous system. But, as is clear to all of us, the character of the nervous system is not that of subjectivity; 'psychological phenomena are not given to people as material phenomena[8]' (Harré, 2002, p. 89). When I experience an object, say a cat, I am aware of a cat and not the simultaneous thousands of neural firings that would be objectively observed given the right technology. As will be noted again shortly, subjectivity and objectivity, first-person experience and third-person observation, are not reducible to each other. To attempt to do so would be to reduce one aspect of our materiality to another. Given this, it is useful to understand that Churchland (1989) is not

[8] Or to use the terms introduced earlier: Subjective physical discourse cannot be reduced to objective physical discourse.

implementing the Truth here, but rather is trying to implement a specific metaphor (that of the nervous system) for understanding the mind to the exclusion of all others.

The second critique is by Harré (2002), which builds on the previous point of the irreducibility of subjectivity and objectivity to each other[9]. He indicates that even if we adopted Churchland's (1989) neurological language we would still land up using these terms and phrases in the same manner that we currently use 'folk' terminology, that is, to refer to our subjective experiences. For example, a child learning to speak could learn to use Churchland's terminology. However, prior to learning about neuroscience, the child would be taught these words, first and foremost, to refer to its subjective states of comfort and discomfort. The strategy of using objective words does not eliminate the existence of the subjective state; you cannot thus erase the fact that you are dealing with a body that experiences various objectively unobservable events. In fact, as Harré points out, it is these states of discomfort and comfort that enable anatomical correlations to be made in the first place. We pursue an understanding of the anatomy and physiology of 'pain' because we experience this particular phenomenon in the first instance. To be fair, Churchland does not seek to challenge the ontology of subjective experience; his concern is more with replacing 'antiquated' discourses with his own brand of Truth discourse. But this scheme does raise the danger, wholeheartedly pursued in the past by behaviourism, of excluding subjectivity from the realm of legitimate science. The exploration of subjectivity would be lost as everything becomes the pursuit of naming neurological processes.

Subjective experience represents a dimension of physicality that objective observation and its terminology cannot penetrate. As Harré (2002) points out, a substitutive objective discourse would forever find itself returning to the subjective functions it wishes to avoid. Mentalist language retains its presence and importance since it gives expression to a dimension of physicality that objective-physical discourse cannot. If we wish to understand

[9] The intricacy of the relationship between subjectivity and objectivity will be elaborated in the next chapter in considering the work of Merleau-Ponty. For now, as has been argued, it should be noted that neither can be reduced to the other and also that neither can be completely separated from the other.

mind then we have to retain forms of subjective-physical discourse[10], that is, forms of talk that signify the 'insideness' of the physical. Subjective discourse attempts to capture the experience of being a lived physicality, it is, in somewhat reductive terms, the electro-chemical matrix speaking itself. To speak only of the body in the terms of the scientific outsider, the objective observer, is to loose the perspective, the experience, of that which is being observed. What is called mind is an aspect of the activity of the physical. To watch the activity of a neural network is not the same as being that network, it is not identical to being the physicality experiencing itself. Thus, echoing Spinoza, two dimensions emerge from the body, that of 'extension' and that of 'mind' and the one cannot be reduced to the other.

A third criticism points out the assumption Churchland (1989) makes about the nature of subjectivity. Harré (2002) indicates that Churchland characterises mental phenomena as mental 'entities', when they do not actually qualify for such a thing-like status. For example, a belief does not have to be understood as an entity but can rather be conceived of a 'broad disposition to speak and act in certain ways' (Harré, 2002, p. 88). In a manner similar to Descartes, where the mental realm becomes occupied by the material concept of 'substances', Churchland enforces a particular material reading of the mind as a space constituted of things and entities. What Harré is indicating here is that such a 'storehouse' metaphor for mind constitutes it as a collection of entities that have to then be causally related to each other. The entity metaphor is applied *a priori* and since mental phenomena fail to meet the objective properties of other (non-subjective) objects they are considered to be scientifically illegitimate.

Regarding mental phenomena as entities also creates the problem of needing to understand the causal relationship between these parts. A common consequence of such an atomistic model is that it assumes the passivity of its constituent entities. Echoing Newtonian physics, such entities are not self-animating but await an external force. As Harré (2002)

[10] And as will become clear in the discussion of social constructionism in the next chapter, it is the discourse through which mind is described which becomes of particular interest since it leads us straight back outside to the social and the historical.

notes, a materialist reading of the mind does not have to assume a passive materiality. For example, La Mettrie, the materialist *par excellance*, posited a material human being 'capable of native and originating activity' (p. 84). This makes the point that corporeality is not an inert substance; the mind emerges from a 'lived' body. Spinoza argued that the body, rather than being a static or inert object, is a constantly recreated stability[11] (Damasio, 2003). Moment-by-moment re-production is an essential aspect of its existence. The body is a system comprised of numerous processes that sustain its morphology and functioning. Without such regenerative processes the body would not be maintained and would disintegrate; a status referred to as death. An inert object does not maintain itself nor does it experience anything. Rather the body is a living structure; it is constituted of copious processes which enable its continued existence. It is not a passive object acted upon by external forces but a dynamic structure comprised of various processes that enable a degree of stability in the status of its structure/s. The psychological is such a process, emerging from a myriad of neural and bodily processes; for example, if you stop neural activities then you stop mind.

The critiques of eliminative materialism articulated above give rise to two alternative forms of material monism; that of emergence and dual aspect monism. The *emergence* model argues that mind is an emergent property of a specific materiality. Here a 'property of a complex entity or substance is emergent, if the components of that entity or substance do not have this property' (Harré, 2002, p. 90). Thus a thought, belief or feeling cannot be attributed to *a* neuron but, rather, emerges from the complex collective action of a multitude of neurons[12]. Mind and brain are therefore equally real phenomena which exist at different levels of complexity or organisation where each has distinctive properties (Solms & Turnbull, 2002). Given this it becomes clear that objective-physical terms may accurately describe the physiological processes that can be observed through the use of various technologies, but they cannot fully account for the dimension of the body's

[11] This understanding is adopted and empirically supported by Damasio, as we will see in Chapter 5.

[12] The reductionist nature of this claim will be countered in, for example, Chapter 5 where Damasio illustrates that mind is more than the nervous system but includes the body and the organism's history of interactions with the environment. This point is returned at the end of this chapter.

subjective experience. Furthermore, an understanding of mind as an emergent property does not signal a return to an incorporeal dimension. There is no radical division present here but a profound intimacy between mind and body. Thus we need to attend closely to the relationship between the body, the environment and the nature of what emerges.

As Solms and Turnbull (2002) point out, the notion of emergence retains the possibility of the reintroduction of the relationship problem. They counter this by what they refer to as *dual-aspect materialism*. Clearly owing allegiance to Spinoza's version of parallelism, the mind-body problem is here considered a '*problem of observational viewpoint*' (p. 57, emphases in original). We are ultimately dealing with one type of substance perceived in two different ways; we are capable of two simultaneous viewpoints. In this way the mind and body aspect of dualism introduces a false tension since we are neither mental nor physical beings in this sense. Physicality refers to an outside (objective) perspective whilst the mental to an inside (subjective) perspective. Mind and body are then artefacts of perception. The common substance, the thing-in-itself, remains unobservable and only its effects can be known[13]. Human beings are, in this case, both the observed and observer. For Solms and Turnbull this dissolves the 'hard problem' of the mind/body relationship and leaves the 'easy problem' of which brain processes correlate with which subjective processes. For them neuroscience can only proceed by combining information from both of these perspectives.

In their emphasis on the neural in accounting for psychological processes, Solms and Turnbull (2002) retain an emphasis on the nervous system as that which can account for our psychological capacities. This is what Wilson (1998, p. 124) refers to as the 'logic of decapitation' that instantiates a disembodied (and rational) brain and in the process a neural Cartesianism. It is this form of neural reductionism that Bennett and Hacker (2003) take issue with in their extensive analysis of the discourse of neuroscience. Where Solms and Turnbull emphasis 'perception' as a way around the division between mind and body, Bennett and Hacker, as well as Harré (2002), consider 'discourse' as the essential practice to consider. They repeatedly argue the point made earlier; mind is not a thing (entity) but a

[13] See the discussion on Kant in the previous section and the section on referentiality in Chapter 4.

way of talking about human faculties and their exercise. To have a mind is to have a distinctive range of capacities (powers, traits) of intellect and will. Mind is not an issue of 'substance', it is nonsensical to refer to it as either something or nothing; it has no place in such a discourse. Furthermore, particular to the point made above, these capacities belong to the human being as a whole and not to parts of it such as its 'mind', brain or body. To place these capacities in the part rather than the whole is what they refer to as the mereological fallacy[14]. I am a 'psychophysical' unity and not two substances: 'The *brain* does not *have* a mind' (p. 106, emphases in original). The behaviour of the human being cannot be understood by understanding the behaviour of the brain but only within the context of a complex socio-historical normative system. It is the person who has agency not the brain. Given this, we may be able to establish the various neural correlates (conditions, necessities) of a subjective process but such endeavours will not fully account for the entire subjective process in question (including its structure and content). This is a theme that will recur across the remaining chapters.

Finally, Harré (2002) echoes the mereological point made by Bennett and Hacker and suggests a solution in the form of three *grammars*, discourses that are essential in making sense of the everyday life of the person but are not reducible to one another and are thus indispensable: The P or 'person' grammar refers to the embodied person who is the origin of activity. This discourse refers to a moral agent who is able to take responsibility for and account for their actions. This means that a person acts with intention and functions within the social realm of normative rules and conventions. We are dealing here with active human beings who are able to use habits, semantics and conventions as tools to accomplish projects. The remaining two grammars refer to natural necessities, empirical (causal) laws and material mechanisms. What is emphasised here is the influence of organic mechanisms in the origin of human behaviour. The O or 'organism' grammar refers to higher animals that are able to act with purpose in achieving an end (though not necessarily with conscious intent within a rule-bound context). The M or 'molecular' grammar refers to the activities of molecules and molecular clusters, the realm of causal relations that is studied in molecular biology and physiology. In this dual ontology then the brain functions as a *tool*

[14] This is discussed again within the specific context of Damasio's *Descartes' error* in Chapter 5.

for the person acting (completing *tasks*) in a socio-cultural context. The relevant neural or other processes can only be identified by considering the task at hand, the P grammar thus enjoying what Harré refers to as 'taxonomic dominance' in determining the relevant O and M grammars. In this way reductionisms that introduce forms of incoherence are avoided.

Notable is Harré's reference to the S or 'soul' discourse where an immaterial soul inhabits a material body, that is, the structure of Cartesian dualism. Harré indicates that this grammar of, what Papadopoulos (2004) calls, the 'incarnate body' has no role to play in the foundations of contemporary cognitive science. The metaphysical reveries of Penfield and his colleagues is, amongst neuro-philosophers like Bennett, Hacker and Harré, a thing of the past, a set of errors where the Aristotelian distinction between form and matter can act as a correction. Here, as previously mentioned, the *psuchē* within the context of the living being, is not a thing, soul, mind, or conscious substance but a biological concept; that which gives identity to indeterminate matter.

CONCLUSION

The above review brings to the fore a number of entwined themes: First, an ongoing concern with essence or form, that which grants an entity its identity. Whether soul, mind, brain, body or person (the individual), it establishes a ground or boundary which determines what the thing is in itself, its being (Staten, 1984). Second, related to the first point, is the search for a centre, that which brings it all together, a point of integration where corporeal fragmentation is transcended. In neuroscience this point has shifted across several cerebral locations to, for now, come to rest in the prefrontal lobes. Again this acts as a ground, a point of origin, from which agency can proceed. It is not by chance that the indivisible mind, that which is always already whole, should consistently find its meeting place with the body at this point of amalgamation. Dispatching the transcendental other has had the effect of throwing the need for a centre wholesale back into the materiality of the body, where specifically the brain enjoys current influence. Third, the body as machine continues to find expression in the deterministic logic of the brain, in the causality of the M grammar. Where the person is capable of agency, the neural incarnations that are necessary

(but not sufficient) to enable such social actions operate according to a causal metaphysic (Harré, 2002). Fourth, the notion of reductionism is omnipresent, whether in locating our psychological capacities in a metaphysical soul or mind, in a Cartesian brain, in the biology of the body, in the asocial individual or in the socio-cultural, this tension is always at play. Even in Harré's grammars the distinguishing lines are never stable; he points out that the scope of a grammar can increase depending on the expansion of particular rationalities. Thus the asocial causal logic of M grammar is increasingly coming under the sway of social intervention, that is, the intentions of the social agent, as technologies allow the penetration of these previously 'natural' foundations (Rose, 2007).

To conclude, in the above we encounter the spectres referred to in the opening chapter, that of essentialism, individualism, determinism and reductionism. But, rather than consider these instances as examples of a long standing corruption that needs resection so that what remains can be used as material for a critical agenda, it is these very themes, as they appear across the various chapters of the '(Mis)readings' section, that will provide the routes for addressing the objectives specified at the end of Chapter 1. The meta-theoretical and methodological grounds for this claim will be articulated in Chapter 4 where, amongst others, the notions of form (identity) and centre (presence) will be reconsidered. For now, in completing this 'Context' section, the next chapter provides a more focussed review of work, mostly in psychology, in relation to the body and in this process provides a more detailed grounding for the objectives previously specified.

CHAPTER 3
(CRITICAL) PSYCHOLOGY AND THE TURN TO THE BODY

INTRODUCTION

The aim of this chapter is to map out the grounds for the objectives specified in the opening chapter of this report. The previous chapter provided a historical and conceptual backdrop for this one, reiterated several themes (spectres) introduced in Chapter 1, and foregrounded the themes of form, vitality and centre. This chapter traces a path, a justification, by means of a critical consideration of conceptual/theoretical work completed around and about the body within certain disciplines, predominantly psychology. We are currently in a phase in psychology, both in its 'mainstream' and 'critical' forms, where the body has made a return, albeit in various guises. This turn is not unique to psychology but can be identified in other social sciences as well, including sociology (Frank, 1990; Blackman, 2008) and feminism (Grosz, 1994b; Wilson, 2004). In describing these turns we then exceed the boundaries of mainstream psychology, a common practice for critical psychology, and consider work conducted across disciplines.

This chapter traces various exclusions of and turns to the body within theoretical work, specifically in psychology. In the opening section, the body is identified as absent from (cognitive) psychology, a dearth which is also identifiable in critical psychology, specifically within social constructionism and feminist writing. A more recent turn to the body can be identified both in cognitive psychology and in the interest shown in embodiment work in critical psychology. As will become clear, we can thus talk about several turns of the body to psychology. Though even in these turns there is a relative absence of what Wilson (1998) refers to as 'this (biological) body' (p. 53). The chapter closes by highlighting the marginalisation of this particular body from most contemporary work, specifically in critical psychology, and proposes to illustrate that through a deconstructive engagement neuroscience provides one avenue for addressing this exclusion in a way that rather than distancing critical work from its criticality enhances its potency.

(COGNITIVE) PSYCHOLOGY AND THE 'ABSENT' BODY

A distinction may be drawn between several traditions within the discipline of psychology. Reference is commonly made to psychoanalysis and its successors, phenomenology and its links to existentialism and humanism, and approaches emerging from more positivist methodologies such as behaviourism and cognitive science. Given that psychoanalysis is dealt with in the previous chapter, that phenomenology is discussed in a later section of this chapter, and seeing its strong links to neuroscience, the focus here will be on cognitive science with passing reference to behaviourism. The 'counter' traditions located under the umbrella term, critical psychology, will be discussed in a later section.

The form of cognitive science that emerged in the post-behaviourist period of the 1950s is currently referred to by a myriad of terms: 'Cartesian cognitive science' (Schouten, 2007, p. 1) 'Cartesian psychology' (Wheeler, in Schouten, 2007, p. 1), 'cognitive science of the disembodied mind' (Lakoff & Johnson, 1999, p. 75), the 'first cognitive revolution' (Durrheim, 1997, p. 10), 'first-generation cognitive science' (Lakoff & Johnson, 1999, p. 75), 'orthodox cognitive science' (Schouten, 2007, p. 1), and 'rational psychology' (Fodor, in Schouten, 2007, p. 1). All of these terms suggest alternatives, that is, a non-Cartesian (non-dualist) psychology or cognitive science, a second-generation cognitive science, an embodied cognitive science, a reformed cognitive science, and an irrational psychology. Clearly the first version of cognitive science laid the grounds for much revisionist action. But this initial version was itself a reaction to an orthodoxy, that of behaviourism. This earlier attempt at a pure expression of logical positivism was itself marked by numerous re-inventions, including operant conditioning and the quasi-behaviourist Social Learning Theory. Here these differences will be overlooked so as to briefly consider behaviourism as a whole.

Arguably the greatest symptom or expression of psychology's misrecognition of the natural sciences' method as identical to the experimental method, behaviourism sought to emulate these 'hard' sciences (van Hezewijk, 1999). This involved an uncompromising adherence to 'objective' observation: What the neutral observer was to observe had to be visible and

measurable. Those processes of mind that may be ontologically assured by the subject but could not be verified by the third-person, standing aloof, were therefore not to be admitted into the scientific endeavour (Durrheim, 1997). Causal accounts were then based on observable behaviour and an S-R (stimulus-response) model of psychology was to be pursued. The consequence for the body was that it, like the mind, was assumed to be passive and only important in so far as it was a display case for behaviour. In referring to the mind and its inherent mental processes as a 'black box' it should not be forgotten that the body too was cast into shadow by behaviourism. The remainder from these exclusions, behaviour, was understood as a mechanical manifestation where behaviours sprang from stimuli. Behaviour was environmentally determined and the behavioural scientist had to identify, through careful experimentation, the underlying laws of behaviour.

Gergen (1985) describes the shift from behaviourism to cognitivism as a swing from an 'exogenic' to an 'endogenic' perspective (p. 269). Whereas behaviourism drew heavily on the empiricist tradition where knowledge was a true reflection of the world, cognitive science hinted back to the rationalist tradition which emphasised the internal processes bought to bear on the world so as to give it form[1]. Gergen identifies the shift to cognitivism as a contemporary manifestation of a long standing philosophical debate between rationalism and empiricism. However, given the dominance of an 'exogenic' model in science, he argues that this has resulted in an untenable situation where cognitivism has pursued an 'endogenic' perspective through the methods of pure empiricism.

In Durrheim's (1997) reading, the return of the mind to psychology was as the result of two influences: First, the need for the discipline to more comprehensively account for its subject matter through the inclusion of unavoidable mental unobservables such as thought and belief. Second, the development of technologies of operationalisation that rendered these mental events open to empirical analysis. Thus Gergen's 'endogenic' perspective was rendered possible in 'exogenic' ways through the definition of the invisible in verifiable and visible terms. The behaviourist S-R model was thus modified to S-O-R so as to

[1] See Chapter 2 for a more detailed discussion of these two traditions.

reinsert the organism into the research agenda of mainstream psychology. This all was possible without seemingly sacrificing the objectivity that formed the cornerstone of any 'true' science.

The form-giving organism reinserted into the psychological project would however be of a particular kind; one reduced to cognition. First-generation cognitive science, which arose in the 1950s and 1960s, retained a Cartesian separation between mind and body (Lakoff & Johnson, 1999). Mind was equated to cognition and was separated from the corporeal. The metaphor of the computer was used to understand these processes (Wilson, 1998). The mind was equated to software whilst the body became the hardware on which the mind ran. This imposed a disembodied notion of mind since the mental processes did not require a particular body for effective performance (Lakoff & Johnson, 1999). The morphology of the body had nothing to do with the morphology of the mind. Consequently the body became but one of a series of possible hardware devices through which cognition could perform its tasks.

The computer metaphor also established the understanding of the mind as an, albeit sophisticated, information processor. Here 'data' input into the system underwent transformation as it passed through a number of pre-identified stages. Through a hierarchy from the sensory to the intellect this involved processes such as sensation, perception, attention, imagery, language, memory, and problem-solving (Wilson, 1998). The mind was understood to manipulate symbols according to a set of rules or algorithms which cognitive science set about identifying (Lakoff & Johnson, 1999). These symbols, signs, representations or data were imbued with meaning either through their relationship to other symbols or through being representations of things external to the system.

Such a scheme has several consequences for how we then understand mind. First, since attention is paid to mental processes that are loosely associated with the brain, the focus falls on 'internalised' cognitions. As a result, the object of investigation is the individual information processor (Durrheim, 1997). Second, given that cognition does not rely on the body it takes on a transcendental hue (Lakoff & Johnson, 1999). As mentioned above,

mental processes, although requiring hardware to run on, are independent of it in all other ways. Cognition is therefore presumed to be disembodied. Third, given that the focus is on individual and interior mental processes, the assumption is that these processes are universal and outside of the influence of the wider cultural, social and corporeal context. By identifying the rules or algorithms underlying information processing, cognitive science aims to identify and understand mental structures and processes that are to be found 'in' *all* human beings. We will consider two responses to these assumptions both of which identify an affiliation between cognitive science and preceding intellectual traditions.

Churchland (1989) refers to 'functionalism' which argues that 'internal states' can be characterised in such a way that no reference needs to be made to their 'intrinsic nature or physical constitution' (p. 10). Instead these states are specified through the 'network of causal relations they bear to one another and to sensory circumstances and overt behaviour' (p. 10). Furthermore, these abstract notions can be 'realised in a nomically heterogeneous variety of physical systems' (p. 10). Given references here to the non-reliance on physical morphology, an emphasis on the various links between stimuli and responses, and the possibility of finding expression through a range of forms of physicality, Churchland's 'functionalism' bears a striking resemblance to the cognitive science described above[2]. He argues that such a schema inverts the theoretical/empirical relationship by finding evidence that fits the functionalist model rather than allowing empirical findings to speak for themselves[3]. The result is that various outdated notions are maintained far removed from the empirical evidence produced by neuroscience. An understanding of cognition as the 'manipulation of propositional attitudes' (p. 11) is revealed as a sign of a poor science steeped in antiquated terms, which have become embedded through long use, and which obscure the facts produced by empirical studies. Churchland's solution to this problem, eliminative materialism, was critically discussed in the previous chapter. Here we note his criticisms and move on to show similarities between 'functionalism' and Lakoff and Johnson's (1999) description of (first generation) cognitive science.

[2] The links to Locke's disembodied transferable consciousness are also notable. See previous chapter.

[3] The intricacies of the theory/empirical binary will be discussed in detail in the next chapter.

Lakoff and Johnson (1999) echo Churchland's identification of a theoretical/empirical inversion in their discussion of '*a priori* philosophy' (p. 74). Referring to the cognitive science described above as a 'cognitive science of the disembodied mind' (p. 75), they argue that this first generation was problematic in that it was grounded in such a philosophy. This philosophical tradition entails a conceptualisation of the mind that has dominated Western thought for millennia. Lakoff and Johnson (1999) trace its development from the philosophy of Ancient Greece up to and including Anglo-American analytic philosophy. They identify various suppositions that constitute an ideal of disembodied reason or what they call a 'philosophy without flesh' (1999, p. 76). The fundamental distinction is the radical Cartesian separation between mind and body allowing for the proposition of a 'Universal Reason' (1999, p. 553), a conscious form of rationality independent of the body and capable of objective contemplation, and thus knowledge, of the world. Given this separation of reason (mind) from the world (materiality), a notion of representation emerges where non-material symbols, that are arbitrary in that they share no correlation with physicality, have to be used to represent the world accurately. Concepts are thus understood literally, that is, as capable of direct and accurate representation of the world. The problem that then emerges is how a correspondence between symbols and real objects can be established and maintained.

Lakoff and Johnson (1999) argue that given this, often unwitting, *a priori* commitment to disembodied reason, the first generation of cognitive science was doomed to failure. It pursued a research project that studied the mind as separate from the body, understanding the former through computer metaphors as a complex information processor grounded in rule-based symbol-manipulation. As indicated, in such a framework the body becomes arbitrary; since the software of the mind is distinct from its locus of operation. Mind can pretty much function in any hardware environment. The further implication of this assumption for Lakoff and Johnson (1999) is that, although these cognitive scientists would agree that for humans cognition was intrinsically located in the body, any empirical evidence that would indicate the essential role of the body in the *form* of reason would be excluded *a priori*.

Lakoff and Johnson (1999) align *a priori* philosophy with a particular form of psychology. This 'Faculty Psychology' (1999, p. 16) acted as a model for understanding the mind across much of Enlightenment thought, finding its latest expression in first generation cognitive science. Faculty Psychology described mind as a range of disembodied 'faculties' arranged hierarchically, each fulfilling specific functions. Information would pass through mind from perception to action. Various intermediate faculties could be identified, each of which would have a role in the processing of information. All could be understood as discrete functions which could be independently studied. To use Lakoff and Johnson's (1999) example: Sense impressions pass from 'Perception' to 'Imagination' where representations are created. These representations are then assigned to concepts by 'Understanding' whereupon 'Reason', the highest function, would weigh up options for action after which the 'Will' would instruct the body in enacting the decision. 'Feeling' added force to these actions but could also be in conflict with 'Reason' causing, if it overwhelmed rationality, for irrational decisions to be enacted by the 'Will'. Finally, the faculty of 'Memory' would retain aspects of items that had passed through this perception-reason-action cycle.

The similarities between Faculty Psychology and the information processing model of early cognitive science are clear. First-generation cognitive science identified various functions that could be independently studied and explained. Sensation, perception, memory, imagery, and so forth, can simply be slotted into the faculty model of yesteryear. It remained Cartesian in nature as the mind was studied independently of the body. Similarly reason, as problem solving, was regarded as the most complex function where effective decision making would follow in situations where emotion was kept at bay. Through identifying the conceptual history of this cognitivism in the *a priori* demands of an inherited philosophical tradition and the disembodied stages of a faculty model of psychology, Lakoff and Johnson (1999) then aim to re-insert the body into cognitive science. The route through which they would attempt this was neuroscience. But prior to discussing this model let us consider a similar disembodied condition that emerged in the critical psychology movement of social constructionism.

THE BODY AS TEXT: SOCIAL CONSTRUCTIONISM

Cromby (2004) indicates that '[s]ocial constructionist psychology is a heterogeneous mosaic of philosophy, theory and research characterised by "family resemblances" rather than conceptual or methodological consistency…' (p. 797). Often traced back to Berger and Luckmann's *The social construction of reality*, published in 1971, the roots of social constructionism are in fact far more disparate. Radley (1995) notes its origin in a variety of texts from the 1960s to 1980s, whilst Gergen refers to a growing body of criticisms of positivist-empiricism emerging from the 1960s onward as forming a foundation for social constructionism. Foster (2008), in turn, comments on how many constructionist writers refer to a variety of philosophical work, some dating back to the Ancient Greeks, in grounding their arguments. In describing the gist of social constructionism, reference is typically made to the 'turn to language' in the social sciences. What however emerges across various reviews is a more extensive set of criticisms of the dominant scientific paradigm of empiricism as setting the grounds for constructionism.

Durrheim (1997) identifies several assumptions made by empiricism which, once opened up to criticism, laid the way for constructionism. These were: 1) the assumption that sense experience could act as the source of knowledge, where numerous verified observations once accumulated provided the truth of the world; 2) a dualistic distinction between ideas (mind) and objects (matter); 3) the positioning of the individual as knower (subject) of the world (object); and, 4) an understanding of language as representational, that is, the notion that verified ideas emerging through language can accurately and unproblematically represent reality.

The above assumptions have been thoroughly critiqued. The central idea that the world could be objectively observed has come under consistent attack, the argument being that there are no facts beyond interpretation (Durrheim, 1997). Any truth claims need to be considered within the context of their social, political and historical development. Facts become facts when an interpretation, a particular reading, becomes institutionalised. Analysis of these 'facts' would usually reveal that they served some or other ideological

function, assisting in the maintenance of particular social relations that usually involved the exploitation and oppression of certain social groupings. Instead of knowledge claims occupying a universal status, critics have argued that knowledge is always perspectival, that is, facts are only facts from within a particular point of view. It is for this reason that empirical methods could often produce multiple and conflicting 'truths', each claim being supported by a body of empirically-grounded research. Rather than this indicating the presence of a number of dubious studies which, once methodologically interrogated, would dissolve to reveal a unitary and non-contradictory truth, this situation reveals the multiplicity of perspectives available on a particular contested issue. Furthermore, these 'facts' would also be prone to change as the social, political and historical context from which they emerge shifted.

Given this challenge to the descriptive and explanatory aims of empirical psychology, the point of interest shifts away from empirically verifiable hypotheses to the language that is used in such 'explanations'. Since categories, as socially derived concepts used to make the world intelligible, precede observations, the social always precedes the empirical. At each moment of observation, the social is always already present. Terms do not spring from the object itself but are negotiated amongst stakeholders in a context usually marked by power differentials between the negotiators. Durrheim (1997) also notes the philosopher Wittgenstein's critique of referential grammar and his point that, instead of the meaning of a word arising from that to which it referred, meaning emerged from the uses a word is put to. In this scheme, words become tools and language could be conceived of as a tool box. Consequently, words do not merely refer to or describe but they construct that to which they point. 'Descriptions and explanations of the world themselves constitute forms of social action' (Gergen, 1985, p. 268). Different constructions of an event, person, situation, institution, or whatever, would have different effects and uses.

Gergen (1985) points out that the above does not mean the introduction of an absolute relativism where truth is cast out of play. Nor does it induct a world where words can be used for whatever one pleases. There are restrictions and these are introduced by the meaning and use of words being socially determined. The correct use of a word is

culturally negotiated, that is, social convention would specify in what ways language could be utilised (Durrheim, 1997). Thus, the shift to language involves an interest in the discourses in which words are embedded. A word becomes meaningful within its discursive context. To understand social life would require an investigation of the ways in which realities are constructed through language and the consequences such constructions have for how we understand ourselves, others and the world. Methodologically the shift is from experimentation to the analysis of discourse. From specifying the universal facts of a concept, attention turns to revealing the social origins and purposes of terms that were previously taken-for-granted or imbued with a natural status (Gergen, 1985). To trouble the natural status of these terms and to change the discourses in which they are embedded would be to change the status of the object 'represented'.

Within a constitutive understanding of language, terms such as 'mind', 'emotion' and 'self' are removed from their internal and mental status and relocated as concepts with a social aetiology and function (Gergen, 1985). From being signifiers of an internal reality they are now regarded as derived from social interaction. They are historically contingent and their specificity can be understood by considering the social climate from which they emerge. As discourse they are taken up by users in conventional ways, these ways shaping the experience of the user. To understand the discourses that are dominant within a particular society and historical period, and how they constitute the reality of the time, is to understand the psychological reality of the people who populate such a world. The shift is thus extreme as the interior preoccupations of cognitivism are replaced with a concern for the discourses that criss-cross and constitute the social world.

Critiques of constructionism

Various tensions have emerged in relation to social constructionism; this includes concerns about its ontological and epistemological investments, which have circled around relativism/realism, discourse/power and constructionism/transformation debates. In this section these issues will be touched on through a focus on the exclusion of the body and materiality from social constructionism. These criticisms have more applicability to what has been termed the 'light' (Danziger, in Cromby & Nightingale, 1999), discursive, or

relativist (Nightingale & Cromby, 1999) versions of social constructionism[4]. The gist of the criticism is that social constructionism engages in linguistic or discursive reductionism (Burkitt, 2003; Cromby & Nightingale, 1999; Nightingale & Cromby, 1999; Radley, 1995), where an emphasis and over-reliance on discourse and language in understanding humanity and the world leads to the exclusion of the 'extra-discursive' (Nightingale & Cromby, 1999). This results in an impoverished theoretical engagement with embodiment, materiality, power and 'personal-social histories' (Cromby & Nightingale, 1999). Here each of these aspects will be considered in turn.

According to Radley (1995), constructionism's engagement with corporeality can be understood in terms of it setting up a 'docile' body and a 'discursive' body. In the former the body is conceived of as an object which is subjected to various forms of social control, coercion and restraint. The aim of these processes is to bring about a 'compliant' body (Radley, 1995, p. 194), a body that has been disciplined according to the strictures of contingent power relationships. Such an engagement with the body, more typical of Danziger's 'strong' version of social constructionism (Cromby & Nightingale, 1999), wherein the focus falls on the formation of subjectivity through the influence of power/ knowledge 'structures', is representative of Foucault's understanding of corporeality[5]. As Radley (1995) points out, what emerges from such a schema is a body as a passive reflection or mirror of society; it has the status of a socially constructed corpse[6].

The second image, that of the 'discursive' body, again produces an erasure of corporeality as it now becomes limited to being an inscriptive surface or metaphor, that is, the body is regarded as text (Cromby, 2004). This image emerges from the 'weak' version of social constructionism, mentioned earlier, where emphasis is placed on the fine workings of discourse, its rhetorical utilisation and consequent effects (Cromby & Nightingale, 1999).

[4] The 'dark' version of social constructionism, which rests on a Foucauldian analysis of society, will be dealt with in a later section in this chapter. In this section only passing reference will be made to this particular 'political' version of constructionism.

[5] The intricacies of Foucault's work and its relation to the body are discussed in detail in the next section.

[6] Although Blackman (2008) points out that for Foucault docility requires the active cooperation of the body-subject.

With such an approach it is talk about the body, rather than the body as a physical object or body-subject[7], that is emphasised. How the body is depicted in discourse, how it is characterised in the achievement of certain aims, and how references to it function in particular ways, become important foci for discourse analysis. In this way, a dualism is re-introduced into social constructionism, that between the signifier and the signified, language and physicality, discourse and the body (Radley, 1995). This represents a problem for an approach which vehemently rejects Cartesian notions of the subject (Cromby, 2004).

In her discussion of feminism's engagement with social constructionism, Grosz (1994b) develops this critique further[8]. The distinctions drawn between discourse and body, psychology and biology, and gender and sex, set up particular characterisations of each of these binary components. Here the body is aligned with that which produces and reproduces; it becomes that which is biologically determined, fixed, ahistorical, pre-cultural and natural. In this way it forms a primary reality upon which the more socially constructed reality can be developed, it is the essential silent other of constructionism. The discourses about the body, the social injunctions for how sexed bodies should behave (gender), and the social practices that then shape particular bodies, are the focal sites for such analyses. It is these superimposed socio-cultural processes that require confrontation. In such a scheme 'mind' becomes a historically contingent, ideological structure, a series of representations that fulfil political functions. What remains untouched is that which is regarded as essential; the asocial, natural, sexed body, and being excluded it is lost as an object for critical analysis and as a resource for critical theorising[9].

Radley (1995) argues that what escapes social constructionism in its conceptualisation of the body as an object, which is disciplined, or as discourse, where it is spoken into

[7] The notion of the body-subject is more fully articulated in the discussion of the work of Merleau-Ponty in the next section.

[8] The various critiques of social constructionism will be referred to again in the section on corporeal feminism.

[9] As we will see in a later section, feminism, struggling with similar limitations, turns towards this exclusion and through the work of Wilson (1998), amongst others, opens a clearing for this thesis.

existence, is the 'lived' body. He refers here to the body-subject, the experienced body which exists in the world. On a less phenomenological level, Cromby (2004) notes that what is lost in such discursive reductionism is the body as a 'fleshy organ bearing both enablements and constraints' (p. 798). If all that matters is talk (or writing) about the body, if the body is only socially constructed, then this reveals an assumption in (particularly 'weak') social constructionism that all bodies as physical aspects are essentially identical. They are then uniform blobs of matter that are all equally malleable to the whims of discursive effect. In this way the body as a material reality, one marked by variation that is not discursive in nature, is erased. This body is not noted or simply does not matter for constructionism; it effectively lies hidden behind the word (Radley, 1995).

Burkitt (2003) notes that if all that matters is how we talk about things then the concern is solely with what is socially produced, with that which is created and produced by us and nothing else. This reveals a remarkable anthropomorphic tendency at the heart of social constructionism. Consequently, not only the body's physicality is ignored but the physicality of the world in general is lost from sight (Cromby & Nightingale, 1999). The constraints imposed and possibilities allowed by our physical surroundings, the way that the physical (including other bodies) is spatially organised, the effects of occupying the space-time continuum, are all excluded from consideration. Discourse is placed on a pedestal taking on almost omnipotent proportions in the formation of lived reality, the only exception being the constraints imposed by social convention (Gergen, 1985). What vanishes when discourse is removed from physicality is how materiality, that of the body and the world, constrains our social constructions (Cromby & Nightingale, 1999). The physicality of the world is not uniform and in its variability it limits what can be constructed in our talk about the world and each other[10].

In the discursive version of social constructionism, where the body as a disciplined object enjoys little room, this results in the poor theorising of the workings of power (Cromby & Nightingale, 1999). The intimate relationship between embodiment, materiality and power

[10] Those who do not limit their utterances to the constraints of this physicality are often constructed as being mad.

is understated in an approach solely concerned with the rhetorical uses of language. Thus the profound manifestation of power in arenas outside of language is given little attention. These would include, for example, the consequences of physical impairments, the use of interpersonal violence, the limitations imposed with regard to access to resources, and the inequalities that arise due to the structural organisation of society.

Finally, Cromby and Standen (1999) emphasise the importance of what they call 'personal-social histories'. Our personal histories are idiosyncratic but are obviously marked or, rather, moulded by the impact of socio-economic and cultural forces and 'the distribution, maintenance and embodied effects of power' (Smail, cited in Cromby & Standen, 1999, p. 149). These histories enter into the present by influencing actions and experiences. Disregarding the history of the body and subjectivity in favour of a concern for discourse is limiting in two ways: First, methodologically, social constructionism's reliance on discourse analysis means that is solely concerned with the functional effects of talk (Nightingale & Cromby, 1999). Discourse analysis relies on a transcript which is already 'a reductive, interpreted abstraction taken from a real interactive sequence' (p. 214). Since the 'extra-discursive features of… embodiment and untranscribable elements of… personal histories' are then lost, this means that 'a functional discursive analysis of the static and disembedded transcript of a conversation would be so partial so as to be inadequate, even invalid' (p. 215). Talk may always be functional or, rather, understood functionally, but this does not mean that it is not also then expressive and representative (Cromby & Standen, 1999). Second, the limits of discourse also need to be emphasised. If the sole focus is on language and its renditions then that which escapes language, those moments when words fail us, are excluded *a priori* (Nightingale & Cromby, 1999). The inability of language to capture or encircle all aspects of our lived experience means that an exclusive focus on discourse would result in an impoverished consideration of the human condition[11].

The emphasis on discourse is also indicative of a fear present in social constructionism in dealing with the body (Burkitt, 2003; Cromby & Nightingale, 1999; Wilson, 1998). The concern is that theorising the body in its physical and phenomenological dimension will

[11] The limits (or economics) of discourse are considered in greater detail in the next chapter.

inevitably lead to the spectres of biological determinism, essentialism, and cognitivism. That is, that a naïve form of causality and empiricism, divorced from the insights about language's constitutive nature, will reinsert itself and the critical and emancipatory aspirations underlying the constructionist project will be lost. Cromby and Standen (1999) point out that this apprehension extends to subjectivity, where talk about the self is, amongst others points, considered to have politically conservative results. Again such an exclusion limits potential engagements of constructionism with a subjectivity that is profoundly embodied.

As has become clear, the costs of its exclusions have profound consequences for the theoretical force of constructionism. But are such fears justified? Cromby and Standen (1999) discuss the constructionist argument that speaking about subjectivity assumes the *a priori* existence of an asocial individual which then reintroduces various mind/body and self/society binaries into theory. They point out that this confuses arguments for the existence of subjectivity with arguments for its nature. We can argue that subjectivity exists without having to then commit to particular versions of such subjectivity. This may be extended to the body. We can argue that the body is more than what is represented in discourse without this inevitably leading us to notions of essentialism or determinism. In fact, as shown in the above discussion with Grosz (1994b), to avoid the body leaves theorising about the body untouched by constructionism and opens it to the ravages of determinist and essentialist sensibilities. Ultimately, leaving the room simply because one doesn't like the company only allows those remaining to dominate the meeting. Rather, the need exists for critical psychology, of which constructionism is a representative, to engage with the physical body, the body-subject, and materiality in general, so as to further trouble any claims that produce a body (and a subject) which is solely genetically determined, asocial and cognitively disembodied. It is these engagements with the body that forms the focus of the rest of this chapter.

BODY STUDIES: TURNS TO CORPOREALITY

The above review demonstrates the exclusion of the body from not only, what has been called, the 'dominant', 'cognitivist', or 'objectivist' paradigm, but also from the its critical respondent, social constructionism. With cognitive science, this exclusion may be conceived as the absence of a body, the only concern being with disembodied cognition. However, this may also be regarded, as Wilson (1998) demonstrates, as the inclusion of a particular type of body, one reflective of male morphology and fantasy, a 'certain kind of body: a cognitively blind, mute and deaf body' (p. 111), one manifesting universal (masculine) reason. With social constructionism the inclusion of cultural, social, and historical contexts results in a body reduced to text or, more problematic, a primary, natural, ahistorical, and asocial body forming the foundation for various secondary cultural constructions (Grosz, 1994b; Sampson, 1998). Sampson (1998) has argued that there are various larger cultural processes identifiable in the West which suggest that contemporary society is re-engaging with the body. Here he mentions feminism's re-engagement with the body[12], the continued Western fascination with Eastern religion and philosophy, and the return to bodily practices in the ever growing Pentecostal religions[13]. One could add to this the preoccupation with dance that marked the popular Trance, House and Rave cultures of the 1990s.

In this section various turns to corporeality are described: First, the turn to the body in cognitive science, especially as depicted in the work of Lakoff and Johnson (1999). Second, the engagement with the body-subject as developed in the corporeal phenomenology of Merleau-Ponty. Third, the inclusion of the body-object in the work of Foucault, the foundation of the 'dark' version of social constructionism mentioned earlier. Fourth, the articulation of a socially grounded body-subject in the work of Bourdieu and the later Foucault, and, finally, the establishment of a corporeal feminism by writers in this

[12] This will be discussed in a later section of this chapter.

[13] Given that Sampson's article was written before the events of 11 September 2001, this does raise the question about how the turn in the subsequent decade to the right, militaristic thinking and escalation of xenophobic paranoia in the West has affected this corporeal flirtation.

critical school. This then lays the ground, through the work of feminists such as Wilson (1998), for the identification of the relative exclusion of a particular type of corporeality from critical approaches; the biological body, and a call for its inclusion.

Cognitive science embodied

Concern has arisen within cognitive science itself with regard to the dominance of the computational metaphor and its notion of cognition as symbolic manipulation determined by algorithmic laws. This includes unease with the continued use of mentalist language[14] and the problematic dualism which then results between mentation and physicality (Thelen, et al., 2001) and, especially, with the exclusion of the body from the process of understanding cognition (Lakoff & Johnson, 1999). This has resulted in a growing preoccupation with the notion of embodiment[15] since the 1980s (Riegler, 2002, van de Laar & de Regt, 2008) and various attempts to articulate an embodied cognition or, in terms of the discipline, an embodied cognitive science. As we shall see this has resulted in some interesting debates concerned with defining embodiment, some effective challenges to static notions of cognition and, often, a subtle return to disembodiment and the comfort of Cartesianism. Underlying all of this is the pursuit of a new discourse for cognitive science, one that manages a shift from computer-based mentalism to a new 'analogic dynamic language' (Thelen et al., 2001, p. 1).

The pursuit of a comprehensive definition of embodiment has preoccupied several cognitive scientists (Clark, 1999; Dautenhahn et al., 2002; Riegler, 2002, Schouten, 2007). Schouten (2007) differentiates between 'weak' and 'strong' embodiment. The former is regarded as a trivial engagement with the notion, where cognition is considered as necessarily physically instantiated, this providing a constraint on thought. This allows, according to Schouten, for a continued pre-occupation with inner processes (what he calls 'process internalism') in a manner that indicates a sustained adherence to Cartesian dualism (p. 1). Embodiment understood as the simple possession of a body makes no reference to

[14] See section on Churchland's eliminative materialism in Chapter 2.

[15] Blackman (2008) uses 'embodiment' in a particular way to refer to approaches that assume no social/ material distinction. In this report the notion is used more broadly to refer to any approach that tries to introduce the body into the realm of contemplation in some way.

the context in which the body is located resulting in a situation where 'a fish swimming in water is as embodied as a dead fish in the supermarket' (Dautenhahn et al., 2002, p. 399). Riegler (2002) refers to this as a 'mere situatedness in complex environments' (p. 339).

A development on the simple granting of a body to cognition is to re-direct the emphasis to the relationship between the 'system' and the 'environment' (Dautenhahn et al., 2002, Riegler, 2002). What is of interest here is that the discourse refers to the abstract notion of a 'system' rather than, for example, a sentient body. This abstraction ties cognitive science's embodiment to a cybernetic paradigm, particularly the constructivist version associated with the work of Maturana and Varela (Riegler, 2002). This conjunction may be understood by noting the disciplines that are invested in cognitive science, particularly robotics and artificial intelligence (Dautenhahn et al., 2002). There is thus an investment in a level of abstraction that allows a range of cognitive scientists' room to pursue their agendas and to not be tied down to the fleshiness of human bodies – but, rather, enables them to focus on the metallic soma of robots. As we shall see this abstraction results in a return to the very dualism cognitive science has tried to escape.

Dautenhahn et al. (2002) have drawn a distinction between a system being 'situated' in an environment, thus being able to obtain information from its context in real-time, to a system being 'embedded' in its environment, where the relationship to the context is so intimate that it 'conceptually may be considered a single system' (p. 410). In such a conceptualisation the interest shifts to the interactions between the various 'agents' rather than a single agent in particular. The term 'embodied embedded cognition' (EEC) is used by van de Laar and de Regt (2008, p. 292) to signify this apparently less individualistic 'new approach'.

Revealing the influence of the work of Maturana and Varela in this field of cognitive science, a central notion used in understanding the link or relationship between a system and its environment is that of 'structural coupling' (Dautenhahn et al., 2002, p. 400). Here the system can influence or 'perturb' the environment, and vice versa, along various definable routes in a manner that does not threaten the continued existence of either. For

Dautenhahn et al. (2002) this then allows for the quantification of a system through reference to its 'perturbatory bandwidth', which indicates the various events to which the system is responsive, and 'structural variability', which indicates the extent to which the system can be perturbed without being destroyed (p. 404). Reigler (2002) also uses Maturana and Varela's notion of 'autopoiesis' to conceptualise a system which is organisationally closed, that is, an autonomous system within an environment (p. 344). This distinguishes it from an 'allopoietic' system which is controlled from the environment, as in the case of a computer.

Given these notions, Riegler (2002) then defines an embodied system as not simply in ('situated' in) the environment but structurally coupled with it. This coupling allows the system direct access to the environment which allows it to be shaped through its interactions with its surroundings. This enables a competent engagement of the system with the environment, wherein the system still retains its autonomy. That is, it is open to being perturbed by the system but is organisationally closed to the extent that it is not animated or determined by the environment – rather it is a self-steering system. For Dautenhahn et al. (2002) such a system can maintain its structure across time, it is a system with a history that can use this to maintain a level of equilibrium. Cognition as reflected in such phenomena as memory and learning is regarded as the degree to which the system is embodied in its environment, that is, its sensitivity to its surroundings and the responsive flexibility its structure allows.

What is of interest is that the above emphasis on systems and their relational links to the environment is used to open up a space for a notion of embodiment which lacks materiality. Riegler (2002) points out that 'embodiment does not necessarily mean physically embodied' (p. 341), whilst Dautenhahn et al. (2002) note that the above 'notion of embodiment is freed from material constraints', opening up embodiment to 'domains such as software' (p. 423). Having started with the acknowledgement (by 'weak' embodiment) that the intellect needs to *physically* instantiated, it is ironic that this process ends with the oddity of a disembodied embodiment. As mentioned, the broad agenda of cognitive science, its preference for using the un-fleshy notion of 'system' to tackle embodiment, and

a focus on the *relationship* between a system and its environment, allows a return to a disembodied mind. What remains is a cybernetics posturing as embodiment theory, classical software metaphors now clothed in inter-systemic relational discourse, more at home in information systems than in the physical reality of human interaction. The real fleshiness of being human is abandoned in pursuit of anthropomorphic machines which, given the contemporary political and ecological crisis of the world, casts such a cognitive scientist as a Nero dressed as Frankenstein, building a monster, whilst Rome burns.

Despite the Cartesian return reflected in the above, more fleshy engagements with embodiment can be discerned amongst some cognitive scientists. The body seems more visible in Thelen et al.'s (2001) definition where embodied cognition refers to '*bodily* interactions with the world' where 'cognition depends on the kinds of experiences that come from having a body with particular perceptual and motor capabilities that are inseparably linked…' (p. 1, emphasis added). Schouten (2007) stresses the intimacy of the structural 'couplings between the brain, body and world' (p. 8). In what he refers to as 'process externalism', it is not only the neural and computational (internal) processes that are significant in understanding cognition but also bodily and environmental processes. The lived physicality of the body is far easier to imagine with such definitions than those that refer to the abstract cybernetic metaphors of systems and couplings.

In developing models that demonstrate such an embodied cognition, there has been the growth of what has been called 'dynamical systems theory' (Clark, 1999, p. 348). Stam (1998) identifies the 'system' as the dominant metaphor in post-World War II psychology, a metaphor that allows a continued relegation of the body to other disciplines. Dynamic systems theory features the hallmarks of a systems model, where everything is regarded as being in simultaneous relationship (synchronic) with everything else (intimate coupling), but in a manner that witnesses an evolution of the system over time (diachronic), thus a 'dynamic' system. Despite Stam's (1998) concern, there are some promising features in such models. In Thelen et al.'s (2001) sculpting of a model that mirrors infant development, another feature of this theory becomes apparent; its opposition to the notion

of representation. In traditional models a linear model of cognition has been formulated[16] where data is perceived, then computed – that being the process of cognition – and this being translated into action (Clark, 1999). Perception and motor responses are thus divorced from the process of cognition; they are simply the input and output trajectories of computation. Cognition, as dominated by the computer metaphor, consists of the manipulation of symbols which represent (re-present) the outer world. Such a conceptualisation relies on a visual understanding of the world, as a model of the world is created through perception so as to be manipulated in private by cognitive processes, effectively casting the external world aside. It is the representation which is manipulated while the world awaits the decision. This echoes the Cartesian representational dilemma described in the previous chapter.

In contrast to the above, a dynamic systems model sullies the boundaries between classical notions of perception, cognition and action (Clark, 1999). The interdependency of perception and action are empirically demonstrated as in the subtle eye movements (action) involved in seeing (perception) (Thelen et al., 2001). The existence of an internal representation is challenged through referral to the process of active perception of the world where action in the world is grounded through repeated observations (Clark, 1999). These observations are determined by the nature of the task, the agent not creating a panoramic internal representation but a real-time orientation to the world that allows the execution of the task at hand. The stability of the world provides the stability required by the agent as it engages with the world. The notion of a divorced and static internal representation is thus discarded in favour of intimate perception-action sequences that are retained through repeated exposure.

A distinction is drawn between such 'on-line' engagements with the world and more distant 'off-line' engagements where the agent considers through 'simulation' possible actions in the world when confronted with particular scenarios (Clark, 1999; van de Laar & de Regt, 2008). The context in which actions and perceptions take place then become important in

[16] A model long in existence as demonstrated in Lakoff and Johnson's (1999) description of Faculty Psychology in an earlier section.

explaining the consistency of behaviours (Thelen, et al., 2001). Consequently, any sharp distinction between the brain, body and world becomes problematic as behaviour patterns are determined by having a specific relationship between a particular body (with specific skills, limits and capacities) and numerous contexts. As Spencer (2001) points out, the advantage of such a model is that there is no essence to certain behaviours. Thus there may be a myriad of contingent factors responsible for a developmental behaviour noticed during infancy. Dealing with multiple parameters in dynamic relation across time means that 'specific things matter in specific ways at specific times' (Spencer, 2001, p. 63). The model thus challenges attempts to provide universal (acontextual) and individualistic (internalised) explanations for behaviours.

Despite the above, the dynamic systems model as expressed by Thelen et al. (2001) retains a number of problematic aspects. Clark (1999) argues for the utility of an off-line symbolic, possibly linguistic level, in cognition, identifying a sensorimotor reductionism in Thelen et al.'s (2002) model. In describing a model of behavioural dynamics that occur in real-time in a field of action, some, echoing Stam (1998), have commented that the model remains fairly removed from the biomechanical materiality of the body (Mareschal, 2001), specifically the knowledge insights provided by neuroscience (Cisek, 2001; Munakata, Sahni & Yerys, 2001; Roberts, 2001). Furthermore, the social context in which behaviour evolves and infants develop enjoys little attention in this model, resulting in the system/environment model indicated earlier (Valenti & Stoffregen, 2001). This is not a unique aspect to this particular model as elsewhere Dautenhahn et al. (2002) refer to social, political and cultural domains as types of structural coupling 'channels', whilst Riegler (2002) refers to the social as an add-on 'dimension'. Thus the social (and its political webs) is relegated to a specificity of systemic relations – rather than a foundational feature – and thus can be relegated in empirical and theoretical engagements. Consequently, despite challenges to the static representational models and the essentialism of traditional cognitive science, there remains at the heart of systems dynamic models an individualism made apparent by a proclivity for asocial and disembodied abstractions.

Within critical and sociological writing reference has been made to a particular model of embodied cognition, that of Lakoff and Johnson (Sampson, 1998; Frank, 1990). In closing this section, we turn to a more detailed examination of this particular reading of the body which aligns itself with cognitive science.

Lakoff and Johnson's metaphorical body

In contrast to '*a priori* philosophy'[17], in which they argue disembodied forms of cognitive science are grounded, Lakoff and Johnson (1999) propose a philosophy of 'embodied realism' (p. 74). This provides the grounds for a corporeal form of cognitive science, where they claim that reason (or more generally, cognition) cannot be separated from the body. Influenced by the work of Merleau-Ponty[18], they state that the body is made of the same material as the world. Not only is reason then located in the body and of the world but, most importantly, and here they transcend Schouten's (2007) 'weak' embodiment, it is *shaped* by the body. This statement requires some articulation.

Lakoff and Johnson (1999) argue that all living beings categorise their habitats. This process of categorisation is essential for survival. For example, it is crucial for even the simplest form of life to be able to differentiate between food and non-food. This ability to categorise depends on the various capacities of the bodies in question, including the specificity and range of their sensory organs and their ability to move their bodies and manipulate objects in the world. That is, their sensorimotor capacities or, to use Dautenhahn et al.'s (2002) term, their 'perturbatory bandwidth'. The different capacities allow various types and complexities of categorisation. For example, the ability to see will result in a visual categorisation of the world which will vary according to the acuity of the vision. This innate disposition to categorise is not only understood to be functional (that is, it allows survival) but is also a consequence of neural morphology. Since neural architecture is divided into levels which range from dense sensory receptors upward

[17] See the earlier section on cognitive science's absent body.

[18] This will be discussed in a later section of this chapter. There has been an increasing flirtation with Merleau-Ponty's work and phenomenology in general in cognitive science, especially EEC, with the subsequent development of the field of neurophenomenology (NP), the pursuit of 'phenomenal invariances' and their correlations to 'neurological data' (van de Leer & de Regt, 2008, p. 293). This is then part of an ongoing traditional universalist project that reduces the body and experience to brain and brain processes.

through ever sparser collections of neurons, the categorisation of information from a previous level is inevitable. Furthermore, this process of category formation is unconscious and automatic and follows from interaction with the world. Categories thus emerge from an interaction between the architecture of the nervous system and the facticity of the world. They are not merely part of experience but shape and differentiate it, meaning that categories are intrinsic to and inseparable from experience. These categories accordingly form the fundamental and stable ground for conscious reasoning.

The categories for reason are accordingly not directly accessible to us and form part of what Lakoff and Johnson (1999) refer to as a 'cognitive unconscious' (p. 9). Cognition here refers to 'any mental operations and structures that are involved in language, meaning, perception, conceptual systems, and reason' (1999, p. 12). Such processes are incredibly complex and occur mostly automatically and consequently are outside of consciousness. In a move reminiscent of Freud's inversion[19], it is these unconscious cognitions that are considered to form the grounds for consciousness. The facticity of unconscious cognition is grounded in empiricism, Lakoff and Johnson (1999) indicating various forms of evidence that have emerged from the work of cognitive scientists since the 1970s. In an attempt to distance it self from *a priori* assumptions, this version of cognitive science emphasises multiple and convergent forms of empirical evidence, the presence of which are considered to provide increasing validity for their claims[20].

To be able to reason this requires the 'mental characterisation' of the categories through 'neural structures' called 'concepts' (1999, p. 19). Lakoff and Johnson (1999) also refer to 'prototypes', which are defined as the conceptualisation of categories. These too are 'neural structures' which permit 'inferential' and 'imaginative' tasks relative to the categories (p. 19). Whether there is a distinction between concepts and prototypes is unclear since both are posited as the mental representation (probably as image or symbol) of categories that

[19] That is, Freud's relocation of the unconscious as primary thus challenging the Enlightenment's emphasis on consciousness and the Cartesian idea that our intentions can be made visible to ourselves.

[20] A detailed consideration of issues concerning ontology, epistemology and methodology are beyond the scope of this chapter and are dealt with in Chapter 4.

enable, that is, provide the mental content for, the process of reasoning. As neural structures, concepts cannot be separated from the body. Again there is opacity here as it is unclear what they intend by this claim. It is assumed that this means that concepts as mental characterisations are enabled by neural circuits that have a distinct structure.

The morphology and capacities of our sensory-motor systems, which includes the larger body structure and its functional abilities, play a profound role in the sculpting of our conceptual systems and, consequently, our reasoning patterns and experience in general. For example, Lakoff and Johnson (1999) argue that colour concepts arise not only from the reflective properties of objects and electromagnetic radiation (external factors) but also from neural and retinal properties (internal factors). Thus concepts are not simply a pure representation of external reality (objective) or a projection onto the world (subjective) but an interaction between the morphologies of the external world and the body. In understanding our experience the corporeality of the body cannot be separated from the materiality of the world. Although colour concepts may vary in significance from culture to culture, they are, according to Lakoff and Johnson (1999), not created by culture but by this interaction.

Lakoff and Johnson (1999) differentiate between three levels of category[21]: super-ordinate, middle-level and sub-ordinate. Take as an example: modes-of-transport / car / Passat. What makes middle-level concepts more accessible to and utilised by reason as compared to the more abstract and concrete levels is that they are the highest level where a single mental image can represent a category, where category members have similar shapes, and where similar motor actions allow interaction with category members. This is also the level where most of our knowledge is organised. It is thus the level where several capacities of the body (gestalt perception, motor programs and mental images) are at their most effective. Thinking in more abstract terms would no longer allow the practical possibility of a category which can be evoked by one gestalt or set of motor actions whilst

[21] Categories here refer to concepts understood as 'categories of the mind' (1999, p. 27). Lakoff and Johnson's tendency to use concept and category interchangeably confuses the issue of whether one is dealing with 'mental characterisations' or the foundational categorisation of the world. For the sake of clarity concept will be used whenever some sort of mental image is referred to.

simultaneously allowing the level of generalisation and knowledge not possible for more concrete or particular instances. These concepts are the basic level because they are most effectively mediated (presented and acted upon) by the body. Embodiment also allows other concepts to emerge such as spatial-relation concepts, which are possible due to having a body that has a front, a back, an inside, a surface, a head and so forth. In this way Lakoff and Johnson (1999), echoing Thelen et al. (2001), aim to trouble the dichotomy between perception and conception. Given that our concepts flow directly from the sensory and motor capacities of our bodies, the distinction between sensing, doing and conceiving cannot be kept strictly divided. For instance, the concept of 'front', although applicable to numerous other situations, flows directly from having a body that perceives mostly via sensory organs located on one side of the body. This muddying of the dichotomy is further supported by several neural model projects that demonstrate how concepts and sensory and motor functions can share and emerge from the same neural systems.

Having argued for embodied cognition and unconscious cognition, Lakoff and Johnson's (1999) final claim is that abstract concepts are largely metaphorical. 'Metaphor allows conventional mental imagery from sensorimotor domains to be used for domains of subjective experience' (p. 45). Embodied concepts are used metaphorically to give form to subjective experience, allowing for a large system of primary metaphors. For example, we can use the experience of temperature to speak of intersubjective experiences such as a 'cold reception', a 'heated argument', a 'warm greeting', a 'luke-warm response' and so forth. We acquire these metaphors automatically and unconsciously simply by being in the world. Once again they take on an almost universal status because they are linked to the primary status (the universal morphology) of the body. Once more this is empirically grounded through reference to neural models that link sensorimotor domains to subjective judgements domains, where the former acts as a source for the latter (and not vice versa).

Primary metaphors can then be combined to allow for the generation of complex metaphors. These complex metaphors are linked to culture as they provide ways to understand and act in everyday life. Cultures may not share the same complex metaphors. One of the examples Lakoff and Johnson (1999) provide is the 'An intimate relationship is

a close enclosure' complex metaphor which is comprised of the simple metaphors 'Love is an enclosure' and 'Intimacy is closeness'. This then allows for cultural expressions such as; 'They are drifting apart', 'They are heading in different directions' or 'Their relationship is breaking up'. When making sense of complex subjective experiences we have no choice but to return to our primary experiences of the world. This does not however mean that metaphors are fixed or beyond examination in terms of their utility.

Lakoff and Johnson (1999) do make room for the influence of culture and history in the derivation of concepts; even at the primary metaphor level it is not necessary that a particular body experience should be tied to a particular subjective domain. However, they state that concepts are not completely relative or contingent given the consistency of the body and its capacities across these contexts and time. Some aspects of experience are considered pre-cultural – there is a fundamentally shared experience of the world due to our shared morphologies and physical worlds from which concepts are derived. A common body allows for common and durable truths, despite this embodiment implying that we have no access to some transcendental position that allows for objective knowledge. The capacity to reason is shared between different cultures not because they all tap into some metaphysical notion of Universal Reason, but because all these groups share the same basic bodies, nervous systems and capacities for action. Frank (1990) points out that these bodily metaphors may be multi-vocal, allowing for varying cultural expressions of subjectivity, but given their embodied nature they are not random. In this way complete corporeal determinism and complete relativism are avoided.

Despite this, Sampson (1998) argues that this Lakoff and Johnson's theorising, although returning the body to theory, still manages to mostly exclude history, culture and community. In addition it continues to 'locate knowledge within the individual and locate the transcendent foundations for such knowledge in an invariant body' (p. 48). For Sampson any claim to a pre-cultural level appears as a search for transcendental foundations, in this case the invariable body. To be fair, Lakoff and Johnson (1999) do

posit an evolving body rather than a fixed, ahistorical[22] body but Sampson's (1998) critique does raise questions about the malleability of the body and its relation to the social and cultural and, ultimately, the web of power relations that saturate these spaces. That is, how does the body give shape to the social as the social gives shape to the body? These aspects are addressed in more detail through the work of Merleau-Ponty, Foucault, Bourdieu, and the writings of several feminists in the sections that follow.

In the recent writing on the social body and embodiment emerging from psychology, three theoretical resources, all the work of French academics, are mentioned with remarkable consistency: Pierre Bourdieu, Michel Foucault and Maurice Merleau-Ponty. Each contributes to the understanding of the body in a unique way, each responding to the limitations of the disciplines and theoretical traditions they encountered. Not meant as a comprehensive review of their work, the following sections provide a synopsis of the way each of these French theorists conceptualised the body. This then lays the foundation for a discussion of feminist work in the field of corporeality.

Merleau-Ponty and the body-subject[23]

For Maurice Merleau-Ponty (1908-1961), the body situates consciousness in the world. Of course, this does not sound like an innovative claim since the rationalists would have argued similarly that it is through the body that we, as cogito, have access to the world. But the emphasis is different here; consciousness does not stand radically divided and outside of context, but is embodied *within* it, or, as Merleau-Ponty (1996) states; 'our body is not primarily *in* space: it is of it' (p. 56, emphasis in original). The world is always already there prior to the abstractions of rationalism or empiricism (Cullen, 1994). Rejecting a reduction to the body-object of rationalism (the body as intricate machine through which consciousness acts on the world) and of empiricism (the objective body as collection of

[22] Questions can be raised about the notion of evolution utilised by Lakoff and Johnson. In what relation does evolution stand to the cultural and social? Do social and cultural practices have an effect on the variance of the body across time or do they position evolution within an asocial and acultural realm of natural time and process?

[23] Matthews (2004) points out that Merleau-Ponty himself never seemed to have used this term but it now generally used to refer to this central aspect of his work.

elements in causal relationship with one another), Merleau-Ponty argues that the body cannot be simply reduced to the same status as that of other objects in the world. Saying that our consciousness is embodied is to say that it is unthinkable outside of its corporeality. It is possible to think of a body without consciousness, such as a cadaver in which there no longer exists any consciousness and which would therefore finally be solely a body-object, but the reverse is not possible. Thus unlike other objects, the body is a lived object. One does not act on one's body, rather one acts *through* one's body. In such an incarnation, perception and action are united and I am able to act on the world and have a perspective on the world. Again there is something troublesome about such a formulation since it does not escape from a rationalist discourse which would also argue that we act through our body-objects. Spurling (1977), perhaps, captures the notion of the body-subject more succinctly when she says; 'I move my body directly, or, to put it another way, my body moves itself, since it is always with me' (p. 21). 'I am not in front of my body, I am in it, or rather *I am it*' (Merleau-Ponty, 1996, p. 58, emphasis added). Thus the radical entwined nature of consciousness and the body is emphasised[24].

Of course it is possible to argue that I can treat my body as an object as when I operate on my hand so as to remove a splinter, but I would then still be acting on my body through my body. Furthermore, unless anaesthetized, I would have a lived experience of the splinter as when I feel jabs of pain as the needle works around it. Thus even in the moments of turning my hand into an object, I never loose my direct subjective experience of it. This is Merleau-Ponty's notion of the 'double sensation' (Grosz, 1994b); I experience being both the surgeon and the patient. That this is possible is an indication for Merleau-Ponty that underlying this subject/object distinction is a more fundamental level of *being-in-the-world*. It is here where his emphasis differs from that of his great influence; the phenomenologist Edmund Husserl (1859-1938). The latter was concerned with revealing the essential core of consciousness, this being achieved through the process of phenomenological reduction, where the investigator attempts to suspend all preconceptions about phenomena so as to reveal their essential ground. With Merleau-Ponty, the focus shifted from essence to

[24] As we shall see, Merleau-Ponty later became critical of his earlier work arguing that it still retained a Cartesian distinction. He then sought to surmount this through his concept of 'flesh', a notion that will be discussed in the next sub-section.

existence, to our *being*-in-the-world. This involved trying to understand our everyday *Lebenswelt* (life-world) freed of scientific and other abstractions (Cullen, 1994).

Spurling (1977) points out that the postulation of the more fundamental mode of being-in-the-world provides the ground for a variety of relations; that of object and subject, the objective and phenomenal body, and that of body and mind. Rather than trying to dissolve 'mind into the body' (p. 23), the early Merleau-Ponty seems more intent of ridding the binary of its Cartesian radical separateness by substituting the notion of *ambiguity*; that is, that we experience ourselves at times as deeply embodied and at other times as quite distinct from our bodies. The emphasis here seems to be on the temporal aspect where these experiences of being mind, or being body, 'can only be partial and provisional' (p. 23), fundamentally grounded in the flow of corporeal existence in the world.

The lived body is the intentional expression of being-in-the-world (Spurling, 1977). Central here is the concept of *intentionality*. Drawing from the work of Franz Brentano (1838-1917) and challenging naturalism's[25] assumption of the independence of world from consciousness, the world for Husserl was a correlate of consciousness in that it was marked by intentionality, that is, that all consciousness was consciousness of something (Matthews, 2004). Consciousness thus always stands in relation to something outside of itself; it is directed to the world. A consciousness with no intentionality, like a consciousness without body, is inconceivable. Furthermore, as relations with objects outside of itself shift, so our consciousness shifts. Relocating the emphasis from phenomenology to an *existential phenomenology*, Merleau-Ponty's concern is with the way in which we live in the world rather than exclusively with the structure of this experienced world (Spurling, 1977).

With his emphasis on the centrality of the body in experience, his approach has also been referred to as a *corporeal phenomenology* (Grosz, 1994b). Central to this phenomenology for Merleau-Ponty, and representing one of his further critiques of empiricism's atomistic

[25] For Husserl, *naturalism* referred to philosophy conceived as the accumulation of empirical facts (positivism) and the determination of the laws of nature (Spurling, 1977). In viewing the world as a collection of objects there was no room in such a scheme for consciousness and its relationship to the world.

reductionism, is that our phenomenological experience of the body reveals that it acts as an integrated whole, a *gestalt* bearing a certain *style.* We usually have a fine and immediate sense of our whole bodies in space and are able to act as a co-ordinated body in such a way that the body becomes invisible in the process (Merleau-Ponty, 1996). For example, if we act on an object, say hammering a nail in with a mallet, we tend to notice the nail and perhaps the mallet, rather than the hand and arm that manipulate the tool (Boothby, 2001). This tendency for the body to become invisible is due to the body acting as a structural whole, an 'expressive unity' (Spurling, 1977, p. 22). One body part does not have to supervise another body part nor do distinct experiences have to be conveyed to a disembodied cogito, since we are our bodies and there is thus an immediacy of experience and action.

Merleau-Ponty extends the spatial parameters of the body to include the tools that it uses to act on the world. Via the example of using a stick to find one's way, a method typically used by the blind, he indicates that once this tool becomes familiar to us, 'the world of feelable things recedes and now begins, not at the outer skin of the hand, but at the end of the stick' (Merleau-Ponty, 1996, p. 59). Merleau-Ponty's body is thus able to obtain new habits[26], that is, the body shows a tendency toward *sedimentation*, where structured actions can be drawn on in the future (Spurling, 1977). We learn to use a stick and as it becomes familiar to us it becomes integrated into and extends the body, both as a way to perceive and act on the world. This extension is not only of the ability of the body but also of its spatiality, both of which extend the experience of one's being (Merleau-Ponty, 1996). Furthermore, habit acquisition is not limited to motor acts but the ability to perceive is itself 'an already acquired bodily skill' (Dreyfus, 1996, p. 2). As these acquisitions alter our style of being-in-the-world, so they form the new ground for the development of further ways to act in the world (Spurling, 1977).

The body is thus the medium which simultaneously allows and limits the perspective the subject has on the world. Its capacities and limitations form the ground through which the

[26] Merleau-Ponty uses skill and habit as synonyms in the sense that a skill is an acquired habit (Dreyfus, 1996).

objects of the world come to have meaning. In filling space and time in the ways that we do as embodied subjects, our perspective on the world is sculpted as we recognise our access to it is partial and fragmentary (Grosz, 1994b). However, this perspective is not a passive one of a being looking in on the world via the senses but, instead, is the active involvement of the entire body in the process of perception (Matthews, 2004). Intentionality in this phenomenology is not simply between a consciousness and its objects but a relation between the whole being and its world. In this way, Merleau-Ponty again counters ideas of the subject as a divorced cogito or a complex stimulus-response mechanism. In being an active body, perception and action are intimately tied together not as a reflex arc but as an *intentional arc* (Grosz, 1994b). These intentions are limited by the dimensions or, rather, capacities of the body and the world and their consequent relationship. We are constricted in terms of what we can perceive and the ways we can act by our morphologies, general skills and cultural skills (Dreyfus, 1996). The morphology of the body allows us to, for example, move, bend and exert our selves in certain ways and not others. These capacities then imply particular basic skills that have to be mastered such as walking, sitting and grasping. More particularly, a culture will demand the acquisition of certain bodily habits possibly not in demand in another culture, for example, the ability to ride a horse, use an abacus, drive a car, and sing an anthem.

In locating intentionality as a feature of the relationship between the body and the world, Merleau-Ponty also removed the need of an 'I think' from the 'I can' of skilful activity (Dreyfus, 1996). The conscious consideration of options and intentions does not need to enter into the intentional arc. As Dreyfus (1996) points out, '[o]ne's body is simply solicited by the situation to get into equilibrium with it' (p. 6). In this manner the gestalt of the co-ordinated body is extended as it is immersed in the larger context. To not act in such a co-ordinated manner results in a sense of deviation and motivates correction without necessarily requiring conscious awareness of the situation. The body resolves tensions and completes gestalts. For example, consider the automatic correction of a car's trajectory by the driver as the vehicle shifts towards the curb. Hence it is possible to engage in 'purposive actions without a purpose' (Dreyfus, 1996, p. 7).

In his discussion of the phenomenological body, Sampson (1998) argues that in taking the body as its ground, phenomenology 'excludes history, culture and community by installing something essential and foundational *within the individual* as the ground for all human endeavour' (p. 35, emphases in original). One has to wonder about the extent to which such a critique can be applied to Merleau-Ponty's work for, as Grosz (1994b) points out, given the location of the body in and of the world, this immediately opens up the body-subject to the play of social, political, historical and cultural forces. Furthermore, these are forces which it cannot assume to ever gain an outside position on since it is constituted by them. Merleau-Ponty understood the subject as a network of relationships (Cullen, 1994). Experience must be understood as both passive and active in the face of such forces; inscribed by them but simultaneously capable of subverting them. For example, Merleau-Ponty regarded language as a cultural phenomenon which enables people to communicate (Cullen, 1994). As cultural, it predates any individual user and constitutes a common world for its subjects through the shared experience of dialogue. It is thus a trans-individual (social) phenomenon that constitutes a dimension of the subject's experience. The body may be a ground but it is a ground that appears to be profoundly socially penetrated and transformed. Merleau-Ponty's body-subject is not outside of the socio-political but, rather, is simultaneously shaped, extended and limited by it. It is a social body.

Merleau-Ponty and the Flesh

In his later work Merleau-Ponty became critical of his earlier efforts and, although not distancing himself from this work, introduced several new notions in an attempt to rid it of what was for him a lingering Cartesianism. He wished to replace a 'bad ambiguity' with a 'good ambiguity' (Cullen, 1994). Again this involved an attempt to define the 'ultimate ground for all human experience'; the field that precedes binaries such as mind and body and which he now referred to as the *field of Being* (Burkitt, 2003). Against such a background, binaries are not in a fixed and simple opposition but, instead, are in what he termed a *hyperdialectic* relationship, where the one term cannot effectively and

permanently exclude the other term but exists in a relationship to its opposite that is characterised by an indistinctiveness[27] (Cullen, 1994).

The body is marked by such hyperdialectic ambiguity as it is simultaneously of the world (an object within it) but also that which experiences the world (a subject) (Cullen, 1994). This may also be understood as the distinction between that which is perceived (and is thus visible) and that which perceives (and is thus invisible to itself). The emphasis on the visible and the invisible was an attempt by Merleau-Ponty to put the notion of 'perception' aside which he now regarded as too easily linked to consciousness (Crossley, 1993). The ground for this relationship of the seer and the seen is *the flesh*. Merleau-Ponty is here not talking about the body but is trying to create a sense of a more general 'element' from which the body and the world emerge (Cullen, 1994). He remarked that the body is made from the same flesh as the world (Burkitt, 2003). Merleau-Ponty is again trying to solidly locate the subject in the materiality of the world and thus to establish it as *of* the world; perceiving and perceivable or, rather, invisible and visible. We are not only something that can touch and see but are simultaneously something which can be touched and seen; both witness and witnessed (Burkitt, 2003)[28]. The ambiguity which arises from the flesh, such as being both mind and body but never fully one or the other, a binary neither fixed nor resolved, is referred to as the *chiasm* (Cullen, 1994). In the body we have an instance of an object that is visible to itself; it is an occurrence of the flesh folding back on itself (Burkitt, 2003). This is an occurrence of the chiasm, of the reversibility or reflexivity of the body-subject. Not only can the body-subject, in principle, see and be seen but it can see and be seen *by itself* and can thus reflect on its own existence allowing for the emergence of subjectivity (Burkitt, 2003).

Merleau-Ponty's use of spatial images such as the bend of the fold, the crossing of the chiasm, and the flexibility of reversibility attempts to capture the interlinked nature of

[27] Grosz (1994) has pointed out that Merleau-Ponty's conceptualisation of binary logic precedes the work of post-structuralism, a logic that will be explored in depth in Chapter 4.

[28] We can draw links here between Merleau-Ponty's chiasm, the parallelism of Spinoza and the dual-aspect monism of Solms and Turnbull discussed in the previous chapter.

binary distinctions and provide a glimpse of the ground from which such distinctions emerge. It is this fundamental unity of duality that is the nexus of his later work. His notion of *invagination* is perhaps his most corporeal and fleshy term for capturing this ambiguity of being both within and without (Grosz, 1994b). Given this, it is somewhat ironic that Merleau-Ponty should draw on such sapphic (as opposed to phallic) metaphors in describing his later ideas, for one of the critiques of his work in general has been that he has failed to take seriously the reality of sexual difference evoking in his writing an asexual, though some would say covertly masculine, body (Grosz, 1994b).

With regard to language, the general fleshiness of the world (of which we are part) is comprised of a surface whose texture provides the ground for meaning which is then articulated and transcended in language (Burkitt, 2003). The ground for text is thus the 'text-ure' of the flesh. This resonates with the earlier arguments of Cromby and Nightingale (1999) that discourse is not simply constitutive but does respond to an extra-discursive morphology[29]. Merleau-Ponty describes a *perceptual faith* in the field, a fundamental belief in the existence of the world, that there is something which coheres without concept and lays for ground for meaning (Burkitt, 2003). It is this faith which generates reflection and enquiry and ironically even doubt in the existence of that world or of a shared world.

Finally, it has been noted that Merleau-Ponty's conceptualisation of the body is of one that is not merely *embedded in* the world but is *of* it. It is a body that is sculpted by the world and the social and cultural processes that form an aspect of it. Despite this Crossley (1993) has pointed out that a dimension of the world that Merleau-Ponty has failed to integrate into his theory of the body was that of power. It is this aspect that forms a cornerstone of Michel Foucault's work.

Foucault and body-power

The influence of Michel Foucault (1926-1984) in the social analysis and understanding of the body is pervasive (Frank, 1990). In distinguishing between their ideas about the body,

[29] See the discussion of referentiality in the next chapter.

Crossley (1996) refers to the Foucault's 'inscribed body' in contrast to Merleau-Ponty's 'lived body'. For Foucault the body is inscribed in the sense of being acted on from without; moulded and controlled through technologies of power (Dreyfus & Rabinow, 1983). It is a body that emerges or, as Foucault dramatically puts it, is destroyed as it is 'imprinted by history' (Foucault, 1994, p. 376). The body, power and discourse (knowledge) form the foundational categories for Foucault[30] in the development of his 'analytics of power' (Dreyfus & Rabinow, 1983; Turner, 1994). Indeed the body forms the essence of his critique of the concept of ideology. What disturbs Foucault about the Marxist conceptualisation of this notion is that it tends to be aligned with consciousness at the expense of the body (Foucault, 1980). He argues that if it were the case that ideology works through processes of repression that exclude 'truth' from consciousness, then 'power would be a fragile thing' (Foucault, 1980, p. 59). Instead power owes its strength to working at the level of the body. As Foucault states, 'nothing is more material, physical, corporal than the exercise of power' (1980, pp. 57-58). It works on and through the body, both as a regulating force and, most importantly, as a constitutive force. As will become clear, for Foucault modern power is not simply coercive but is that which constitutes the subject (Dreyfus & Rabinow, 1983). The 'body becomes a useful force only if it is both a productive body and a subjected body' (Foucault, 1979, p. 26). Furthermore, power and knowledge are in an intimate relationship. They are both located by Foucault within a binary where neither can operate outside of, be reduced to, nor be conceived apart from, the other (Dreyfus & Rabinow, 1983). Where there is knowledge there is the working of power and where there is power there is the articulation of knowledge. Thus the Western mechanism of power/knowledge is localised in the body (Dreyfus & Rabinow, 1983).

To be able to claim that history leaves its 'stigmata of past experience' on it, the body has to be a substance that is malleable (Foucault, 1994, p. 375). It is not a body that stands outside of time and society; rigid and constant. However, as Dreyfus and Rabinow (1983) point out, the extent of this malleability is never made clear by Foucault. Instead he seems to wander between the parameters set by Nietzsche and Merleau-Ponty, where the former

[30] I am here referring to the 'middle' Nietzschean Foucault, rather than the 'early' Saussarian Foucault where totalitarian discourse determines the subject sans agency (Mather, 2000).

conceived the body as endlessly open and the latter constrained it through the identification of structural invariants. Foucault's hesitancy to articulate the body in detail is considered by Crossley (1993) to be the result of an indistinct, 'sweeping and rhetorical' (p. 404) style, not overly devoted to notions of 'argument and evidence' (1996, p. 221). This leads him to attempt to specify Foucault's presuppositions about his otherwise unexplicated subject. Before turning to this, the emergence of the modern body-subject as both object and subject needs to be briefly detailed.

Given the emphasis Foucault places on the body and his location of such concepts as the soul, psyche, and personality as the effect of types of power embedded in forms of knowledge, it seems reasonable to assume that his subject is embodied. 'The soul is the effect and the instrument of a political anatomy; the soul is the prison of the body' (Foucault, 1979, p. 30). Thus the body is produced and constrained by historically embedded power/knowledge practices. With this inversion of the Christian expression[31], he renders all mentalist concepts equal, one no more real than the next; all are instruments of power located in discourse, some currently more prolific and influential than others. There is no real need to pursue the metaphysical project of determining the respective realities of these concepts since they are all contingent regulative technologies. Foucault's concern is thus not with metaphysics but, rather, with a 'microphysics of power' that operates on and through the body (Ostrander, 1996, p. 257).

Across his middle to later work, specifically *Discipline and punish*, published in 1975, and the first volume of *The history of sexuality*, published in 1976, Foucault articulates the rise of a new form of power in the West, one which emerged with the Enlightenment (Dreyfus & Rabinow, 1983). He contrasts this form of power with the power of the sovereign, where it was the body of the king which was made public and those of the masses remained indistinguishable and nameless, unless they managed to affront the monarch (Crossley, 1993). In such cases the king's power was often made brutally visible as it literally tore the body of the offender apart in public displays of torture and execution (Foucault, 1979). A

[31] Where the body was often conceived, following on from the Ancient Greeks, as the prison of the soul. See previous chapter.

knowledge of the body was simultaneously demonstrated as a myriad of techniques were utilised to induce and prolong pain in the body of the transgressor[32]. In this way the power of the king was confirmed and the mob regulated. However, this form of regulation was limited in that it had to have an audience to be effective and risked the possibility of an inverse effect, that of the mob turning against the king in an act of support for his victim (Dreyfus & Rabinow, 1983).

Subsequent to this limited form of power emerges *bio-power*, a new form of power/ knowledge which involved control through both the classification and reproduction of the human species, and *disciplinary power,* a variety of technologies for the manipulation of the body to produce a 'docile body' (Foucault, 1979, p. 136). The aim of these technologies was therefore the control of the species in general and the individual body in particular. The focus now fell on making the body of the mob visible through the administration of society and the individual body in an ever more refined manner. Hence what becomes of interest to Foucault is not so much the theories of the time but more so the contemporary technical manuals which specify routines, exercises, methods and structures for the regulation of individuals, be they soldiers, prisoners or workers (Bartky, 1988). In such texts detailed attention is paid to all aspects of the body; its anatomy is dissected so that its various movements and capacities can be analysed and disciplined. What now occurs is an inversion[33] of the visibility of power; it is now the ordinary individual whom is made visible, especially when s/he deviates from the specified norm for the population, and it is power which becomes invisible, no longer embodied in the king but rather distributed in numerous discrete ways through the bodies of the population (Crossley, 1993; Louw, 2002).

[32] However, given the horrifying struggle to carry out the instructions for execution described in the opening pages of *Discipline and punish* (1979), with the consequent amendment of the techniques on the day, this suggests that these methods of execution often were more in line with sadistic fantasies than actual accurate knowledges for the destruction of the body. Such fine grained knowledges would be the pursuit of disciplinary power rather than sovereign power.

[33] Crossley (1993) points out that 'inversion' would be too strong a term and serves as an illustration of Foucault's sweeping style. A shift in the relations of visibility/invisibility would probably be a more accurate description of the greater visibility of the populace in bio-power in contrast to the centralised power of the king.

As knowledges and practices become more specific and detailed, so the workings of bio-power becomes more infiltrative and subtle. What is important here is the surveillance of the masses, the identification of deviation from the established norms in order for these norms to remain in place and administration to remain effective (Louw, 2002). Such surveillance would of course have to be microscopic and unremitting and it is here where the establishment of a self-regulating subject becomes essential (Bartky, 1988). Foucault (1979) describes, through his analysis of Bentham's Panopticon, how disciplinary power functions through the invisible presence of surveillance, how it is established as always there but unverifiable. It is this characteristic which establishes a subject that has to then engage in unrelenting self-surveillance. Unsure of when the eye of the other is upon it, the individual body now regulates itself as if it were being watched, consequently establishing the regulation of power as automatic and ever present (Bartky, 1988).

With the rise of these technologies the body as object is established, as it is sculpted not only through the practices of various social institutions but by the subject itself. We interiorise the regulatory gaze as we watch ourselves for any deviations, any lapses in discipline (Bartky, 1988). But for Foucault the body is not only regulated through such objectifying practices, so called technologies of the object and objectification, but also through another set of practices; technologies of the subject and subjectification (Dreyfus & Rabinow, 1983). Tracing confessional practices across history he identifies the emergence in the 19th century of a new purpose for confession; not for the salvation of the soul but for the regulation of the body (Foucault, 1980). Although not exclusively so, these confessional technologies are class related as Foucault locates them amongst the bourgeoisie, the objectifying practices being more commonly applied to the mute body of the proletariat (Dreyfus & Rabinow, 1983). The core of these practices is making the private public by calling for the articulation of experience. Since this subjectivity can only be expressed in the discourses[34] available, this articulation simultaneously gives form to this inner experience. Whereas the technologies of discipline were concerned with the

[34] Discourse is understood here as linguistic practices that express various knowledges and are thus enmeshed with particular power relations. Given this, discourse is not simply descriptive but constructs the experience it describes.

production of mute and docile bodies, the so called 'technologies of the self' were about producing talking bodies.

For Foucault (1976), these technologies became established through a focus on sexuality and the establishment of the repressive hypothesis. He describes how sex was transformed from being a fairly public and unimportant phenomenon, except when it came to the formation of family alliances, to being something hidden and private whose various dimensions, such as procreation and masturbation, required careful administration. This regulation is enabled by the belief that power is essentially repressive, obfuscating truth, hiding it from view, and so oppressing the subject. Consequently, speaking the truth of one's desires, making these visible to both oneself and the other (usually in the form of the expert) enables greater freedom and allows one to escape from the grips of power (Dreyfus & Rabinow, 1983). Foucault (1976) locates this notion as a myth and regards it as an example of the workings of contemporary power *par excellence*. Confessional practices rather extend the grip of power on the body, now infiltrating the subject's sensations and pleasures, as we are now obliged to speak about them. Emerging with such technologies are what Foucault refers to as the 'dubious sciences'; sciences deeply involved in the production and extension of disciplinary and bio-power. With the development of new forms of power we have the development of new institutional forms. With disciplinary technologies we have the rise of the objective social sciences whilst with the rise of confessional technologies we have the emergence of the interpretive sciences (Dreyfus & Rabinow, 1983). Foucault (1980) points out, that as from the 1960s the objective regulation of the body has become more subdued but has also witnessed the intensification and development of the technologies of the self[35].

The above briefly describes how Foucault traces the modern development of the body as object and subject; a substance that actively regulates itself both as a disciplined object and as a confessing subject seeking emancipation (Blackman, 2008). But, as previously mentioned, the nature of this body, the exact dimensions of its capacities, are never fully

[35] The subsequent emergence of control societies in contrast to disciplinary societies will be discussed in the final chapter.

articulated by Foucault (Barad, 2003). Crossley (1993) argues that in order for regulatory technologies to be possible, several presuppositions must hold. It is clear that Foucault's subject can be aware that it is being watched. Thus the subject would have to be sentient. Here sentience refers not merely to being able to sense aspects of the environment but in addition being able to have a meaningful experience of the world. The other's watching means something to the subject being watched. Also, since it is subjects that watch and not objects, Foucault's subject must be capable of being aware of the presence of another subject. It is therefore in an intersubjective relationship, implying the presence of communication. This would be essential if there were to be any hope of sculpting this subject according to various routines. Finally, since there is then a distinction between subjects, the watcher and the watched, the subject is able to differentiate between self and other. Elsewhere Crossley (1996) points out that, in being an 'inscribed body', it clearly must be a body that can be trained; it can take up the skills forced on it and furthermore master them. In order to be trainable, the body would already have to possess certain basic skills, such as levels of co-ordination, which can be further structured or built on. It is also then a body that can retain its skills and hone them until a level of mastery is achieved.

Crossley's (1993, 1996) analysis of Foucault's notion of body exposes points of silence, even contradiction, which he then seeks to address by placing this work in dialogue with that of Merleau-Ponty. Similarly, and echoing the feminist critique of Merleau-Ponty, Bartky (1988) identifies a silence in Foucault's work concerning the differences in the ways that men and women's bodies are disciplined; a silence which she then gives voice to through her own analysis of female practices. Where Crossley and Bartky attempt to reinforce Foucault's work on the body through supplementation or development, Turner's (1994) objective in contrast is to dismantle it, arguing that it is essentially reactionary and marked by profound despair[36].

[36] Although Foucault dismantles the notion of a liberated utopia given his linking of power and knowledge, this does not imply that the contemporary relations of power cannot be resisted. They can but the result will not be emancipation, the relations of power will shift possibly seeing the end of old dangers but always introducing new ones, thus calling for continuous critical analysis (Dreyfus & Rabinow, 1983). To thus equate Foucault's position with nihilism or political despair seems extreme.

For Turner (1994), Foucault's 'inscriptive body' is passive, an 'inert, subjectless, physical object' that 'has no flesh' and whose life (activity) is entirely the product of the workings of power/knowledge (p. 36). For him this excludes an alternate dimension of the body; that of a corporeal site in action, an embodied agent in social and physiological relation with other bodies. The latter part of this critique seems limited by Crossley's (1993) identification of Foucault's body as necessarily being intersubjective, capable of recognising others and communicating with them. However, the possibility of agency for a body produced and constrained by power/knowledge does at first sight seem limited. Foucault's response to this is to indicate that power cannot exist without resistance, that it is only through opposition that power become visible.

There are two forms of resistance; that of counter-discourses and that of the self-creating body (Mather, 2000). The latter implies a critical reflexivity, the ability to reflect on one's position in society and to then act on this reflection, and hence indicates the return of the active subject to Foucault's work. Mather (2000) indicates that this also re-instantiates the agency/structure binary that haunts sociological theorising. What bothers Turner (1994) is that Foucault appears to locate such resistance, linked to the body's inclination for pleasure, in a pre-discursive source[37]. These capacities are situated as trans-historical and trans-cultural and as a result prior to society and politics. Resistance is then left to private acts of deviation enabled by the body's innate capacity for pleasure. This would be a position which contradicts Foucault's (1994) commitment to historical determination but it would also counter Turner's own claim of Foucault's body being inert since, given the innate propensity for pleasure, it would then be capable of animation outside of the life-giving influence of power and discourse. Also, Turner's reading of resistance seems quite narrow given Foucault's (1994) own articulation of history as a 'hazardous play of dominations' across time (p. 376). This means that relations of power are not constant but are marked by discontinuities where shifts occur and new dominations come into play. Domination implies that there are relations of inequality and that there are knowledges and practices

[37] This is another point of departure of Foucault from Marx; where the latter emphasised the labouring body, Foucault follows a more Dionysian angle and equates the existence of the body with pleasure and transgression.

that are marginalised. These can be identified and used as forms of resistance to dominant knowledges and practices. To replace central practices with marginalised ones, or counter-discourses, could be considered a non-reactive type of resistance (Dreyfus & Rabinow, 1983). This reading of resistance does not draw on notions of pre-discursive and innate sources but identifies society as comprised of numerous discourses and practices, some dominant, others marginal, some conservative, others revolutionary; all historical.

Turner (1994) points out that Foucault does not provide a phenomenology of the body; that is, the experience of being a subjected and productive body remains unarticulated. Furthermore, the body, although awaiting the animation of discourse, is presupposed to have an *a priori* individual unity. Barad (2003) also points out that Foucault fails to unpack the nuances of how anatomy and physiology, as salient non-discursive forces, are entwined with history and the dynamics of power/knowledge. These points are also noted by Crossley (1993) but where as for him this silence and contradiction requires supplementation, for Turner it seems to justify the complete exclusion of Foucault's work. The above responses to his critiques suggest that this would be an extreme action.

Bourdieu and the habituated body

Pierre Bourdieu (1930-2002), a French philosopher and sociologist, provides a constellation of concepts that, in contrast to Foucault's relativism, are intended to be applied at the level of mediated universalism (Mahar, Harker, & Wilkes, 1990). The concepts are mediated in the sense that they are considered to be, generally speaking, trans-historical and trans-cultural. They reflect tendencies across societies and have to be judged in their applicability through the empirical study of particular contexts. In the same way as Merleau-Ponty tried to find an alternative to rationalism and empiricism (Spurling, 1977) and Foucault attempted to escape the confines to structuralism and hermeneutics (Dreyfus & Rabinow, 1983), so Bourdieu took issue with the sociological options of structuralism and voluntarism (Crossley, 2001). He was influenced by the then dominance of Marxism and phenomenology in France but, similar to Foucault, sought to retain the radicalism of these approaches whilst escaping their limitations (Mahar et al., 1990). Marxism's structuralist emphasis left little room for agency whilst phenomenology emphasised this at

the expense of the structural context from which this agency arose (Crossley, 2001). Contrasting with Merleau-Ponty's search for a more fundamental ground, Bourdieu sought to avoid a reduction to either position through the articulation of a dialectical relationship between structure and voluntarism (Mahar et al., 1990).

Of the triad of concepts (field, habitus, and capital) that form the core of Bourdieu's theory of practice, it is habitus that most directly involves the body (Pizianis, 1998). With this concept Bourdieu acknowledges the influence of objective social structures whilst simultaneously creating room for individual agency. In a manner clearly indebted to Merleau-Ponty, he locates the body as a thing amongst things which is also capable of comprehending the world: 'As a body and a biological individual… I occupy a position in physical space and social space' (Bourdieu, 2004, p. 54). Habitus is understood as a system of embodied dispositions that are 'inculcated' or internalised as a result of the body's position in physical and social space. Social structures are incorporated so that habitus is a 'structured structure' (Crossley, 2001). This then implies that it is an 'active residue or sediment' of the agent's past experiences, that is, it is a historical formation (Crossley, 2001, p. 93). An agent's dispositions are representative of society or, more specifically, of the various positions it occupies within a society (Cromby, n.d.). Dispositions refer to a myriad of embodied patterns, including facial expressions, accents and what Bourdieu calls the body's *hexis*, its 'style of deportment' (Lane, 2000, p. 99). This refers to the manner in which the agent moves; its posture, gestures and comportment. Furthermore, habitus extends beyond objective behaviours to the experience of the subject through the inclusion of a *nomos*; a social structuring of thought and feeling (Bourdieu, 2004).

The ability to develop dispositions, that introduce durability and regularity to the body's behaviours and perceptions, is considered to be 'a natural predisposition of human bodies' (Bourdieu, 2004, p. 58). This is linked to the body's openness to the world or, as Bourdieu (2004) succinctly puts it; 'we are disposed because we are exposed' (p. 62). The use of the notion of 'disposition' is important since it refers to a *tendency* to act in particular ways, thus avoiding simplistic causal or mechanical models of behaviour, more typically associated with behaviourism, where a particular stimulus always results in a specific

behaviour (Scott & Stam, 1996). Instead habitus is a mediating rather than a determining structure which, since it functions at a level below consciousness and language, does not require the continuous presence of a conscious subject (Mahar et al., 1990). As with Merleau-Ponty and Foucault, Bourdieu decentres consciousness; in opposition to the dominant emphasis on 'conscious, intellectual comprehension', his interest is with 'practical comprehension' and its exercise (Bourdieu, 2004, pp. 53-54).

Habitus is also a 'structuring structure' in that it reproduces particular aspects of society. This is due to its tendency to replicate particular behaviours and see the world in ways similar to its primary socialisation group (Crossley, 2001). The body as a singular physical object individualises the world but as a substance open to the world, and thus capable of inculcating habitus comprised of social structure, it embodies and reproduces the collective (Bourdieu, 2004). Bourdieu's body is thus a socialised body, constructed by social experience but simultaneously enabled to generate, construct, classify and unify it surroundings (Bourdieu, 2004). Whilst this then returns agency to the body, this agency is not regarded as completely conscious action. All action, even conscious behaviour, is pervaded by dispositions as the body spontaneously adjusts to the demands of the situation (Bourdieu, 2004). This recalls Merleau-Ponty's notion of the body flexibly completing the gestalt demanded by the context it finds itself within (Dreyfus, 1996).

Agency is not only enabled and constrained by these dispositions but also by the objective material conditions inherent in the environment (Mahar et al., 1990). In order to understand this constraint (and habitus in general) more fully it is useful to consider Bourdieu's notions of field and capital. He ties these three concepts together in a formula meant as a heuristic device rather than a universal formula:

(habitus x capital) + field = practice

What the formula immediately indicates is that what the agent actually does in society is more than a matter of its incorporated dispositions but, rather, emerges through a consideration of its interaction between the notions of capital and field.

Social space for Bourdieu (2004) is made up of fields which are themselves comprised of positions (Mahar et al., 1990). There are numerous semi-autonomous fields including, for example, legal, academic, economic, political and artistic fields. They are semi-autonomous in that they can and do influence each other. As with the body, the social world is fundamentally open to other possibilities, structures and change (Mahar et al., 1990). Within these fields habitus plays its part by determining and acting on what should and should not be done and with what priority. Where there is a perfect fit between habitus and a position, the distinction between (internal) dispositions and (social) position does not emerge, a position referred to by Bourdieu as *doxa*. However, since fields are dynamic and multiple, one is usually confronted with situations different from those within which the primary habitus was originally produced. Habitus must then be a transposable system of dispositions to be of any use to the agent. Consequently, the adaptation of habitus to a habitat is usually a matter of degrees of integration (Bourdieu, 2004). This means that the agent typically struggles to occupy and maintain certain positions within a field.

Forms of capital give fields their meaning, and positions are of value due to their capital (Mahar et al., 1990). By capital, Bourdieu refers to any resource that has some social value and can be exchanged. Different forms of capital are recognised in particular fields. Bourdieu's definition extends beyond the typical economic understanding of the term. He thus differentiates between economic capital (a reified form of capital with a precise numerical value, existing independently as money), cultural capital (valued cultural practices, including tastes and consumption patterns), symbolic capital (status and recognition) and social capital (the connections and networks which the agent may have access to) (Crossley, 2001). To illustrate the above consider the position of a judge. This is a formalised position within the legal field and is tied to various forms of capital; economic through its association with good remuneration, cultural in that is associated with various formal qualifications, symbolic in that it is a position of high status and influence, and social in that it usually involves extensive connections within the field.

Habitus itself may be considered as affording the agent certain types of capital as particular embodiments and perceptions allow easier access to certain positions in a field (Mahar et al., 1990). Thus, for example, speaking with a certain 'educated' accent may make obtaining a position within a business more likely than an accent associated with being 'uneducated'. Each agent therefore has access to different forms and amounts of capital that allow the possibility to compete for positions in various fields. The stigmatisation of some dispositions or appearances has the effect of causing a deficit in capital and can thus exclude particular groups from certain positions (Crossley, 2001). When effectively excluded from influential positions in certain fields due to a deficit in capital and the absence of 'appropriate' habitus, such groups find themselves spoken for and represented by other groups (Mahar et al., 1990).

Being engaged in a field involves a profound degree of preoccupation with the processes of capital accumulation and maintenance. The complete immersion of the agent in the field usually means that the arbitrariness of the habitat, its social construction, is lost to the agent (Mahar et al., 1990). Instead the engagement with the field feels completely natural and self-evident. This adherence and non-reflexive knowing of the field represents what Bourdieu (2004) refers to as the *illusio*. Furthermore, these practices are mirrored, supported, legitimated and, if need be, rectified by other agents in the field. This mutual maintenance, or *collusio*, does not always require conscious communication.

The introduction of a rupture in the *doxa*, the development of a gap between the habitat (field) and the individual body's habitus, leads to an alteration in the pattern of dispositions (Bourdieu, 2004). As objective circumstances change around the agent so the habitus responds to these changes. A disposition not called upon will not reveal its existence and may very well disappear from the habitus. Dispositions may also be altered through conscious effort (volition). Habitus, although effectively structured by the primary socialisation of the body (resulting in the primary habitus) and prone to the reproduction of the environment where it feels most comfortable, is not inflexible nor unchangeable (Bourdieu, 2004). This inherent adaptability allows for innovation and improvisation within the social arena. Given the distinction between habitus and position, the agent may

adopt a number of so-called *postures* within a position indicating that there is room to manoeuvre (Mahar et al., 1990). Bourdieu (2004) does allow for the general occurrence of what he calls 'mismatches, discordance and misfirings' which require the agent to remain, in varying degrees, open to, conscious of and responsive to such occurrences (p. 78).

Bourdieu has been critiqued for, and has admitted to, paying more attention to the reproduction of, than the forms of resistance to, positions within certain fields (Crossley, 2001). However, he does point out that the status quo is the outcome of a long history of struggle which is often erased from social memory so as to produce a sense that the current circumstances are natural. Furthermore, the emergence of a lack of fit between habitus and habitat allows room for critical reflection and possible resistance to contemporary practices. Crossley (2001) points out that Bourdieu at times confuses the notions of agency and habitus, implying that it is habitus that acts and improvises rather than the agent. He argues that the creative nature of agency cannot be fully accounted for by a system of dispositions. Bourdieu also fails to articulate how the agent can engage in the field prior to being structured by it; that is, pre-habitual action (Crossley, 2001). For that matter how does he explain non-habitual and rational actions where neither can be reduced to a set a habits? His account of subjectivity is also found lacking; an absence that Crossley (2001) feels is more adequately addressed through Merleau-Ponty's embodied phenomenology.

Feminism and corporeality

Initially resisting practices that locate women[38] as men's commodities (Irigaray, 1996), feminism has taken on a myriad of forms and approaches all striving to retain the critical project whilst countering neutralising adoptions into male-dominated institutions, as has been the case with the 'Psychology of women' (Wilkinson, 1997). Strategies have included; exposing practices that sexually oppress women through disqualifying, devaluing and misrepresenting their sex and sexuality (Grosz, 1994a), identifying the parameters of

[38] The category 'women' (and thus 'men') has been acknowledged as problematic. Part of this has been the recognition that feminism itself constitutes this category through a series of naturalised exclusionary practices (Wilson, 1998). The consequent imposition of such a notion has coercive and regulatory effects which undermine the feminist agenda. One trajectory through this has been to recognise the category as inherently unstable but as still a crucial component of feminist politics.

patriarchal epistemologies that define women as body and biology[39] (Hughes & Witz, 1996), historicising conceptions of women taken to be natural and ahistorical (Harré, 1998), and revealing women's own unacknowledged complicities with masculinism (Kirby, 1993). Aside from such critical endeavours, there have also been attempts to sculpt alternate representations of women as agents, in various dimensions, moral, social, intellectual and sexual, that break from patriarchal dimensions (Grosz, 1994b). Within psychology, or strategically positioned outside the discipline in an attempt to escape contamination, feminism has addressed several sub-disciplines, including, social, cognitive, and developmental psychology, so as to reveal their biased knowledges (Wilson, 1998).

In its struggle against such patriarchal structures and masculine logics, wherein women (and men) are defined only through the terms of the dominant Other (Grosz, 1996), feminism's relation to and understanding of the body has meandered between outright rejection to ever increasing and revolutionary re-engagement. Hughes and Witz (1996), for example, note the denunciation of the female body in the writing of the French feminist, Simone de Beauvoir, in 1949. Locating the oppression of women within their situation, one dominated by a sexist ideology, de Beauvoir counters essentialist readings of women's behaviours and experiences (Young, 1980). These were not the natural manifestations of their bodies, hardwired across the ages, but the expression of an oppressive context where women have been convinced that their biology is their destiny and that their bodies are their entire identities (Hughes & Witz, 1996). Instead the needs, desires and functions of this body were not to be seen as *a priori* givens but as emerging through a particular socio-political order. Given this, it is then civilisation that produces women and this social aspect (gender) had to be distilled from the sexed reality of the body and actively addressed in the search for women's liberation.

For de Beauvoir the status of the female body was negative, a burden which alienates, a lactating, menstruating and reproducing hindrance (Hughes & Witz, 1996; Wilson, 1998). Patriarchy's crime was partially its attempt to reduce women to the negative factuality of

[39] Modes of representation where women's and others' bodies are seen as variations of the ideal body: Young, white, male, heterosexual and middle-class (Kirby, 1993).

their bodies. A distinction is thus drawn between the body and freedom, women needing to overcome not only their social situation but also their biological constraints. Once the body is cast aside (or, rather, tolerated) the goal of equality and the identification of universal similarities could be pursued (Grosz, 1996). Such a humanist agenda erases women's particularities and the difference of sex so as to produce a general humanity, one that, as Grosz (1994a) points out, inevitably reveals the contours of the same old patriarchal order.

The establishment of the sex/gender binary can be understood as a base/superstructure model, where sex represents the materiality of the body and gender the level of cultural interpretation and inscription (Kirby, 1991). In such a schema the body takes on the sole status of body-object, pre-discursive and asocial, the body as biomedical anatomy (Morgan, 2005). Gender becomes the significances society attributes to sexed bodies within particular cultural orders (Butler, 1998). The binary thus effectively locates the body as outside of meaning (Grosz, 1996), and political action is then only possible at the level of gender (Wilson, 1998). Critical attention must then be paid to the countering of man-made systems of representation (Hughes & Witz, 1996) through the development of new systems of signification and representation of women (Grosz, 1996).

Within such a framework the body then features (in a progression similar to developments in social constructionism) at i) the level of discourse where analysis focuses on how it is represented and spoken about in various cultural niches (Hughes & Witz, 1996), ii) as a substance in which culture inscribes particular embodiments (Grosz, 1996), and iii) as that physical reality which constrains the expression of gender (Morgan, 2005). Having established this primary distinction, feminism then sets in motion a number of theoretical engagements with gender, or more specifically, masculinity and femininity. In radical feminism the dominance of masculine values is challenged through the inversion of this binary where the values and practices attributed to femininity are celebrated and regarded as superior (Harré, 1998). In androgyny theory masculinity and femininity are identified as limiting stereotypes enforced on particularly sexed bodies and the project becomes one of identifying and celebrating the cohabitation of the masculine and feminine within each body (Wilkinson, 1997). Finally, in post-feminism the war between the gender alternatives

ends in a truce and the two genders become equally appealing, suggesting a world where one could eventually choose one's gender irrespective of sex (Harré, 1998).

The utility of the sex/gender distinction has however not gone unquestioned. The binary bears similarities to the body/mind distinction, where an inert or emotive (hysterical if female) natural body must be ruled by a culturally in/formed mind. Within the patriarchal order, mind, as that which is rational and divorced from emotion, belongs to the realm of men, whilst body is equated to the feminine (Gatens, 1996). This warns that any critical engagement by feminists which leaves the sex/gender binary intact risks leaving a fundamental patriarchal inscription unchallenged. The body retained exclusively at the level of the body-object reinserts what Foucault refers to as the empirico-transcendental doublet, where corporeality is left open to objective and empirical investigation without transgressing into the field of subjectivity; the unitary and rational mind (Morgan, 2005).

Although retaining a gender/sex distinction, Young (1980) acknowledges that a body-object discourse cannot speak comprehensively for the lived body and engages with the body-subject through the corporeal phenomenology of Merleau-Ponty. If we are products of our situations, as de Beauvoir has argued, then for Young this sexist order will show itself not only at the level of representation but also at the level of comportment. Distinctive masculine and feminine postures and ways of moving are identifiable and each tends to cohere (with exceptions) with male and female bodies. The distinct manner of moving through space, of holding one's body, of engaging with objects within one's environment, are not solely ascribable to anatomy since they emerge well after birth and prior to puberty. Being therefore socially produced they reflect the oppressive order within which they are sculpted.

Young (1980) describes a feminine embodiment typified by a restricted range of movement, a cautious and fearful engagement with the environment, and only partial dedication of the body to a task. This is captured for her by the statement 'throwing like a girl' where the ball is thrown using only the arm and not through the simultaneous rotation of the shoulders and trunk as is found in more masculine embodiments. Rather than the

body transcending it object status becoming, in the moment of action, a body-subject acting as a whole with intention, the feminine subject always remains conscious of its body as a thing, an object. Consequently, in such cases, transcendence is always ambiguous, intentionality inhibited and the unified action of the body discontinuous. This is as a consequence of being reared in a sexist society where women are looked upon as things, are taught to continuously watch their bodies as objects, and where the threat of transgression or shaming requires a closed, discrete and restricted range of movement. For Young, such a society physically handicaps women, as the body as a pure presence in, and openness to, the world, defined by remarkable capacities, is closed down.

As mentioned, Young's (1980) turn to Merleau-Ponty allows a feminist engagement with the body as lived, the body-subject. Others, such as Bartky (1988), Bordo (1998), Butler (1993) and, to some degree, Grosz (1994a, 1994b), have turned to Foucault as a resource which not only allows a return to the body as primary site for social inscription but enables a radical rethinking of the sex/gender binary or even its complete disposal. In contrast to de Beauvoir's characterisation, this return is to the body as an escape from the socio-political order, the body as unthinkable realm of possibility, a conceptualisation that contrasts sharply with the body as natural fact or hindrance.

The Foucauldian argument that allows such a trajectory is that sex does not provide the ground, the pure foundation, upon and through which culture erects its variations. Instead sex itself must be understood as the effect of a particular socio-discursive regime, that of sexuality (Grosz, 1994a). It is this matrix of practices, discursive and otherwise, that gives rise to the conviction that humanity ontologically consists of dichotomously sexed bodies (Gatens, 1996). Sexuality here refers to the myriad of wishes, desires, practices and impulses that result in distinct morphologies, the evidently biological given reality of sex (Grosz, 1994a). The body becomes determinate via this process of social inscription, which retroactively creates the very surface it writes upon. Such a counter intuitive understanding (Wilkinson, 1997), addresses itself directly to the material form of the body in a fundamental way. For some the acceptance of such a level of cultural formation indicates

the redundancy of the concept of gender since the body, now freed from its position as invariant ground, itself becomes the site of cultural expression (Gatens, 1996).

Running alongside this redefinition is a shift from a politics of equality, so central to humanism and early feminism, to a politics of difference. At one level this implies the recognition of the specificity of the female body without implying some universal female experience (Grosz, 1994a). At a more radical level, patriarchy is understood as a heterosexist matrix which fixes, circumscribes, limits and names the body into the binary of two sexes where one sex is positioned as superior, its supremacy enabled through the denigration of the other (Butler, 1993; Grosz, 1996). The traces of this social production are erased so as to locate sex as asocial and natural, a biological fact, resulting in bodies clearly meant for certain functions: for men the task of production, for women that of reproduction (Gatens, 1996). What becomes hidden in this process is that there is no monolithic or single body but a pliable and plastic body, one whose capabilities show remarkable historical and social variation (Grosz, 1994a). The body is reconceived as a potential multiplicity, always insisting on alterity, capable of a plethora of possible becomings and ruptures that defy the containment and binary logics of any culture, patriarchal or otherwise (Grosz, 1994a). Given such a conceptualisation of corporeality, Gatens (1996) calls for a non-polarised engagement with difference. Within such an understanding, Harré's (1990) model for the differentiation of the sexes[40], for example, becomes an object for suspicion, an attempted instantiation of the patriarchal order. Acknowledging such a profound level of social influence also troubles the sex/gender binary by indicating that there can be no pure body; it is not possible to articulate a body that is pre-discursive, pre-embodied or pre-inscribed. One will only ever find a body that is always already marked and formed by society.

[40] Harré (1998) differentiates between primary indicators, overtly the genitals and, more significant, the covert sex chromosomes, as the level which establishes sex as bipolar. The secondary endocrinal level creates body morphologies not so clearly distinguishable, a bimodal set of differentiators. Finally, culture enters at the tertiary level where gender comes into play in differentiating bodily comportments and practices. Harré does, however, trouble this schema by referring to a core/envelope expression of genetics where male genitalia (envelope) may be accompanied by a female anatomy (core) and vice versa. For Butler (1993) the continued contestation about 'the' sex criterion exposes the instability at the heart of this binary system.

Butler retains the sex/gender binary but challenges the primacy of sex by inverting the dichotomy and articulating a general gender as the discursive apparatus which gives rise to the specific notion of gender, the secondary term inscribed on an originary sex (Hekman, 1998; Hughes & Witz, 1996). Sex is thus never distinct from the gender apparatus but is the effect of the latter. Consequently, sex should not be the ground from which to launch enquiries but instead should the very object of enquiry. Here, showing again the influence of Foucault, Butler regards the body as an effect of power/knowledge formations (Hekman, 1998). What Butler (1993) emphasises in this framework is that matter should not be understood as a surface or site (the ground for action), but as the effect of a *process* of materialisation. Furthermore, the sexed body is not the result of a single defining act but emerges through a process of activity, the unrelenting reiteration of a heterosexual matrix through which the sexed body and subject emerges. Gender is thus regarded as performance, a continuous re-establishment of a particular socio-political order that creates the illusion of a stable body. Echoing this, Grosz (1994a) speaks of a body whose identity is determined by what it does rather than what it is claimed to be. The identity of the body is the result of performativity; it is an enacted materiality (Blackman, 2008)

Since the heterosexual matrix creates sexed bodies through a process of circumscription in a realm of difference, it necessarily constitutes and simultaneously excludes various bodily morphologies, desires and ways of being in this process of definition (Butler, 1993). That is, the certainty of the sexed body can only be bought about through a series of identifications and dis-identifications, the fixedness of sex can only come about through the creation of an outside, a realm of 'non-bodies' that continuously threatens to disrupt the heterosexual order. The stability of two sexes is thus an illusion since at its heart is an instability that must be kept at bay through the relentless (violent) reiteration of a heterosexual structure. This implies that the specificity of the body always emerges through a set of relationships; it is an effect of the play of difference. The body is thus understood as a signifier, or more accurately, a nexus of signification, whose meaning is enabled through its relationship to other signifiers[41] (Welton, 1998).

[41] This notion of positivity emerging through the play of difference will be further developed in Chapter 4 which deals with post-structuralism.

Bordo (1998) has accused Butler of discursive foundationalism. This criticism appears to have both an ontological and methodological dimension. Strictly speaking, Butler (1993) does not appear to be guilty of discursive reductionism; she does not dispute the existence of materiality but makes the important point that whenever we acknowledge the materiality of the world we inevitably concede to some version of this materiality. This reiterates the earlier point of the impossibility of a pure body, one unmarked by discourse or untainted by the words that attempt to describe it. Where Bordo's concerns become more apparent is in Butler's (1993) discussion of the constraints placed upon constructionism; she questions whether it is some outside, some physical real, which constrains the possibilities of materialisation or whether this constraint is not also a variable boundary of political investments. Here gender is seen as producing the notion of a pre-discursive or extra-discursive reality. Whilst Bordo also locates exclusion as the site from which radical change becomes possible (Hekman, 1998), she emphasises the material and practical aspects of existence, the real pain caused to fleshy bodies by discursive regimes, a level of experience that seems unacknowledged by Butler (Bordo, 1998). Just because one cannot ever speak outside the effects of discourse does not imply that discourse is the only reality[42]. Methodologically Bordo questions Butler's method of providing subversive possibilities through textual readings and indicates that what are required are concrete material analyses that expose the effects of phallocentrism's dualist sex (Hekman, 1998).

Finally, Wilson's (1988) critique of Butler's deconstruction of gender is extensive and takes aim at gender theory in general: The notion of gender is founded on the exclusion of biology as its natural other. Given that sex is a constitutive segregation it cannot simply be unproblematically recouped under a generalised notion of gender. At the heart of gender theory there lies more than a (politically useful) denaturalisation but an anti-biological moment which then not only positions the biological as politically bankrupt but as the natural enemy of the emancipatory political agenda. Echoing themes in the previous chapter, sex consequently remains an inert or nefarious substance awaiting the supplementation of culture in order to gain critical potency. Any gender theory which then

[42] Here the earlier criticisms in the section dealing with social constructionism should again be noted.

attempts a rapprochement with sex is always already limited by a binary which prevents it from exceeding its constitutive prejudice. The biological as that which exceeds the cultural, which is in it self a resource for the transformation of the critical agenda, is thus foreclosed. In the final section we turn to consider the relative exclusion of 'this (biological) body' (Wilson, 1998, p. 53).

BEYOND THE 'BLACK BOX' BODY

For the behaviourists the body-subject took on the status of a 'black box', the invisible processes that occurred between stimulus and response were not the grounds upon which to build a positivist psychology. In less oppositional terms, the internal workings of the body have remained outside of the concerns of many who have turned to corporeality. The abstract schemas of some cognitive behaviourists (e.g., Thelen et al., 2001) have omitted the body whilst seeking embodied understandings, whilst others (e.g., Lakoff & Johnson, 1999) have sought support for their ideas in neural network models, which, as models, retain a clear distance from the fleshy activities of the brain (Papadopoulos, 2004). Some constructionists and feminists, through the work of theorists such as Merleau-Ponty, Foucault, and Bourdieu, have returned to the body as more than an object of discourse, but as a materiality formed by the socio-political orders in which it exists. But the biological aspects of the body are seldom mentioned. Not that references to biology, specifically neurology, has been taboo in their critical work; Merleau-Ponty's analysis of the brain-damaged Schneider was important in his development of the idea of the body as active gestalt (Grosz, 1994b), Foucault makes passing mention of nerves and the importance of anatomy and physiology as loci for power (Barad, 2003; Dreyfus & Rabinow, 1983), and Bourdieu refers to the work of the neuroscientist Joseph LeDoux[43] (Bourdieu, 1993). But these are passing moments in the larger scheme of their projects. Furthermore, the absence of biology has been for reasons other than parsimony, for the term has been burdened by associations that have only recently been questioned.

[43] LeDoux's *Synaptic self* (2002) is dealt with in Chapter 7.

Morgan (2005) and Wilson (1998) refer to the restrictive biology/social binary that lies at the heart of the (pure) sex and (social) gender binary which has preoccupied feminism. The consequences of such a binary are that it implies that biology is innate, passive, inert, ahistorical and (at best) politically impotent; the raw material upon which constructionism works (Grosz, 1996). Biology has been particularly kept at a distance in feminist writing (Hekman, 1998; Kirby, 1991; Wilson, 1998). Here, to talk about biology is to enter into the realm of essentialism where biological determinism is inevitable and women's bodies become fixed by patriarchal agendas. Bordo (1998), for example, refers to biology as being regarded as an area for scientists, an apolitical terrain outside of the critical programme. In Butler's work, Wilson (1998) identifies a discourse/biology binary where sex, as a product of a discursive process, excludes other historically bound processes and leaves biology in a passive position, awaiting the other so as to be viable. For Merleau-Ponty, the disciplines of biology and psychology could not be dissolved one into the other; the one could not fully stand in for the other (Grosz, 1994b). Yet, for him, what unites them is that they both assume a body that is fundamentally passive. This gave rise to his attempt to theorise the body-subject, discussed above, that involved a living and active corporeality.

For Grosz (1994a), feminism has confused biology with 'biologism' or, its institutional expression, the discipline of biology. This distinction attempts to remove the real of biology from the discursive regimes through which it is 'described' and constructed. Biologism is associated with patriarchal essentialism, the interpretations that attempt to fix biology (e.g., the nervous system) into place, to present it as unproblematically present and static (Wilson, 1998). Furthermore, as Wilson (1998) points out, for feminism to leave 'this (biological) body' aside in fear of contamination is to surrender materiality to determinist and patriarchal readings (p. 53). These knowledges continue to be developed under the guise of apolitical ventures undisturbed by critical projects such as feminism that, through a sweep of the hand, dismiss a vast area of work potentially open to radical interpretation. This exclusion that dogs feminism extends beyond neurology to the fields of cognition and perception setting up the false dichotomy of political and apolitical knowledges. The political nature of biology and the radical potential of biological theories are left unexplored as a result of such dogmatic responses. For Wilson (1998) the critical

project is always contaminated by that which it attempts to question[44]. It is a constitutive contamination that cannot simply be denied for such an action brings to bear unreflective forms of violence which includes the limitation of critical potency. The question is then not whether critical ventures should engage with biology but, rather, *how* they then should occupy this field, this place of the biological body.

For Grosz (1994a), Kirby (1991) and Wilson (1998), other possibilities exist for biology, beyond the determinist notions feared by feminism, ones that regard biology as a socio-political expression (Grosz, 1994a), and of biology and culture being inextricably intimate (Wilson, 1998). These readings tend to place biology in a less passive role where the biological body is seen as being able to rewrite itself once its intimacy with the social is acknowledged (Kirby, 1991), where biology is seen as a form of writing rather than simply the written (Wilson, 1998). The aim of such projects that dare enter into the realms of biology, such as neuroscience, is to investigate the writing of subjectivity at its most basic physiological level (Unger, cited in Wilson, 1998), to consider what the 'political contributions of biological matter' are, and to reveal particular biocultural instantiations of the body (Wilson, 1998, p. 62).

Biology as subject matter is not in itself an explanation. In chronically, consistently and relentlessly characterising biology as unavoidably deterministic, natural and asocial, the biology that constitutes part of the flesh of the world, that remains the irrepressible of the real, remains marginalised and excluded. This project hopes to reassert biology's position as part of the surface from which meaning springs, to revivify biology as one of the textures that give rise to the endless articulation of the symbolic. In re-minding biology, the surface which is theoretically inscribed in critical work is extended, just as Merleau-Ponty's stick extends the being of the body. This is the reintroduction of the internal, but in its concrete and not figurative (mentalist) sense. Here I am referring to the structures that lie under (and include) the skin, the spatial terrain occupied by the body's innards, rendering these as surfaces for the play of critical meaning, as resources for the critical agenda.

[44] See Chapter 1.

An increasing number of critical re-engagements with biology have started to emerge over the last decade and a half: Cromby (2004), countering a trend of discursive reductionism, has drawn on the theoretical work of the neurologists Antonio Damasio[45] and Michael Gazzaniga to return an embodied subjectivity to social constructionism. Lewis (2002) draws on neurological research to develop a model that provides a biological underpinning for dialogical self theory. Watson (1998) attempts to demonstrate a convergence between the critical philosophy of Gilles Deleuze and Felix Guattari and the theories on affect and consciousness of Gerald Edelman and Daniel Dennett. Similarly Globus (1992, 1995) uses connectionist neurological models as an empirical instantiation of Derrida's post-structuralism[46]. The above studies all demonstrate an engagement with the biological as supplementation, either as a material or empirical instantiation or as a conceptual resource for the expansion of an existing critical social theory. This is a notable bidirectional trend of engagement for both the social and biological sciences (Blackman et al, 2008).

Others have engaged with biology as an excessive materiality that troubles existing traditional and critical conceptualisations. Keane and Rosengarten (2002) draw on various forms of biological research to disrupt traditional dualistic notions of the sexed body whilst Wilson[47] (1998, 2004) has, across various papers, used biology, including neurology, to both disrupt patriarchal logics and to provide critical resources for feminist politics. Brennan's (2004) consideration of endocrinal processes in the communication of affect amongst people challenges individualism, ocular- and cogito-centrism. The project detailed in this report approximates the ambitions of this collection of work, but distinguishes itself from these studies by means of a generic move of sorts; that is, it is a (mis)reading of particular respected texts by eminent 'proper names' in neuroscience[48]. Aside from hoping to disrupt the limiting discursive reductionism of social constructionism and the naïve and conservative empiricism of neuroscience, its objective is to make visible the critical

[45] Damasio's *Descartes' error* (1994) is dealt with in Chapter 5.

[46] Globus' work will be discussed in more detail in the closing chapter.

[47] Wilson's reading of connectionism is discussed in the concluding chapter.

[48] These texts and their selection criteria will be discussed in more detail at the end of the next chapter.

potency of neuroscience through a direct engagement with such influential contemporary work in the field.

The above review, spread across two chapters, highlights various themes central to contemporary body studies (as specified in Blackman (2008) and Blackman et al (2008)): The body is, within constraints, a malleable substance capable of being disciplined but also capable of remarkable variation and extension. It is an open corporeality, in an intimate relationship with its outside, be it the social or the 'physical' environment. It is a historical soma; embedded in a socio-political trajectory it reveals the ideological contingencies of its context. It is a primary materiality which displaces consciousness and reason bringing affect and unconscious processes to the fore. And it is a lived and experienced body, one capable of agency, a disruptive and excessive source of vitality. But it is also a mansion haunted by various spectres; the essentialism of biologism and naturalism, the reductionist and determinist logics that support individualism, the relentless re-imposition of various dualisms, and the discriminatory ambitions of racist, sexist and heteronormative universalisms. It is thus the quintessential contested field, the nexus or quilting point of numerous tensions, (critical and conservative) ambitions and radical possibilities.

The objective here is follow the suggestions of Wilson (1998) and to engage with the biological not as an object for critique but as a resource for critical theorising. More specifically (and practically) it is to 'build a critically empathic alliance with neurology' (Wilson, 2004, p. 29). This concentration on the neurological body requires us to find ways of reading the products of neuroscience not in a naïve empirical way, as a resource comprised of multiple un-invested, asocial and supplementary facts, but in a spirit of negotiation, one informed of the dangers of complicity, one seeking the 'faithful transgression' (Wilson, 1998, p. 36). We therefore turn in Part 2 to issues of methodology and meta-theory so as to sculpt an avenue for such an engagement.

PART 2
METHOD AND META-THEORY

CHAPTER 4
METHOD, DECONSTRUCTION, AND THE LIMITS OF ARTICULATION

INTRODUCTION

The first part of this project ended with the identification of 'this (biological) body' (Wilson, 1998, p. 53) as one of a number of exclusions within both critical[1] and mainstream psychology. The identification of this relative absence provides the justification for the current endeavour; that is, to engage with (a variety of texts identified with the discipline of) neuroscience not as an object for critique, that is, as further evidence of the nefarious machinations and effects of patriarchal, capitalist, or colonial ideologies and practices, but instead as a *resource* for critical theorising. This suggests a critical engagement of a different sort, not one concerned with the eradication and replacement of a series of incorrect and politically dubious theories and texts, but alternatively a criticality that seeks to work closely with such texts, to be complicit in some way, to work *from within* their conceptualisations and logics, in the hope of critically reading these as potentially potent schemas. The aim is to attempt to bring to light some surprising implications, these emerging from closely exploring the convolutions of the text. This may then provide alternate conceptualisations of the body (subject) - those that, when placed in dialogue with the general ambitions of critical psychology, could provide unexpected routes for theoretical and political engagement.

As indicated at the end of the previous chapter, it is necessary, prior to engaging in such a set of analyses, to clarify what it means to 'read' something critically. More specifically, what it means to work from 'within', what it involves to approach texts as resources rather than objects for critical elimination (negation). Such a set of clarifications requires me to address the notion of method and to then specify what the morphology of such a set of procedures (and their underlying epistemological and ontological presumptions) are within the specific context of this project.

[1] See Chapter 1 for a brief overview of the agenda of critical psychology and a discussion of the problematic mainstream/critical binary.

In order to address the above, this part of the project (which consists of one chapter) is divided into several sections: In the first the myth of 'the' (standard or universal) method is addressed including the elaboration of a broad typology of methodological postures. This ends with a broad indication of the specific direction to be adopted for this project. The second section then provides a more particular description of the analytical procedures adopted here. Here the 'method' of deconstruction is discussed including its conceptualisation, the diversity of strategies associated with it, and its inherent politicality. This is followed by a discussion of the limits of articulation, where a critique of deconstruction is addressed. In particular, referentiality and the theory/empirical binary are unpacked, notions which lie at the heart of the effectiveness of this project. Drawing the above together in the final section, the seemingly regressive return to language is addressed; not that of a discursive reductionism but, rather, an understanding of language that transcends the empirical/representation binary. In closing, a preamble to Part 3 of this project is provided in which the selection criteria for the texts to be (mis)read are specified.

A TYPOLOGY OF METHODOLOGICAL POSTURES

The choice of 'method' for this project will be justified by means of the identification of a typology of methodological postures, that is, a set of broad positions adopted in relation to the procedures of analysis involved in research. Via this process, the reason for presenting 'method' in inverted commas will also be clarified. Five postures are delineated; here they are termed 'methodolatry', 'anarchism', 'guru-ism', 'localism', and 'critical method'.

Methodolatry

'Methodolatry' is a term used by Yanchar, Gantt, and Clay (2005, p. 34) to describe a retreat to, and understanding of, method as a set of fixed or formulaic procedures that, if rigidly adhered to, will allow the researcher to proceed unproblematically and naturally to truth. Similarly Osbeck (2005) refers to a 'prescriptive methodological monism' (p. 20) or 'method as rule' posture (p. 8), where adopting a set of rules for quantification, manoeuvring and reading qualifies as *the* method, a universal set of procedures that require

no more than rigorous obedience for scientific progress. Method thus acts as an orthodoxy, a 'mechanical fact producer', a foundation, an algorithm, or recipe for salvation, where other aspects of the research process are placed in a subjugated position (Yanchar et al., p. 35). It is as though questions of ontology and epistemology have been rendered invisible (or reduced to a set of dogmatic knee-jerk responses) through an assumption that these concerns have been previously resolved and are now trouble-free. The researcher thus proceeds with the empirical task at hand, what Machado, Lourenço, and Silva (2000, p. 2) call 'factual investigations'. Here the research question itself is made to fit *the* method and not vice versa, the intent being to generate facts so as to disprove or provide support for the theory under consideration.

In order to elucidate such a 'methodolatry', I will draw substantially from Machado et al.'s (2000) description of the obsession in mainstream psychology with 'the Scientific Method' (p. 13). They identify an overemphasis in the discipline on factual investigations at the expense of the conceptual interrogation of claims and theories. The latter are aligned with philosophy and are avoided since they are stereotyped as speculative and metaphysical and thus far removed from the foundation of empirical facticity. An outcome of such methodological dogmatism and casting of conceptual work to the margins is that the conceptualisations involved in claims and theories remain uninvestigated. For Machado et al. (2000) such a practice culminates in three outcomes: i) A preoccupation with technical matters, the upshot being the development of very sophisticated experimental and statistical procedures. ii) The artificial fragmentation of the field of psychology where areas of specialisation are not the result of the contours of the phenomenon under investigation but rather due to the rigid adherence to particular methods and beliefs. This gives rise to a culture in which the contribution of predecessors are erased wholesale with claims to a better or superior truth, and where specialised journals emerge resulting in sophisticated levels of internal critique whilst excluding broader (possibly devastating) outsider commentaries. iii) A mechanical pursuit of truth where the generation of a large volume of empirical outputs is equated with scientific progress.

The scientific method implies a particular image of research where theories are sculpted from previous research findings and where these in turn are used to generate hypotheses comprised of operationalised (measurable and observable) concepts which can then be empirically investigated (Machado et al., 2000). Positive experimental results provide support for hypotheses (and consequently the theories from which they are generated) whilst negative results call for the modification or rejection of theories. This implies a systematic observation of the world, supported by the verification of facts by the replication of research, the clear linking of concepts to what is observable, and the apolitical and objective accumulation of facts as we steadily progress towards truth.

Machado et al. (2000) argue that devotion to *the* scientific method is unjustified. They challenge these notions by noting the history of science and showing how the systematic generation of numerous studies has not settled debates in psychology, how contrary empirical findings do not result in the rejection of theories, how unverified theories often last as long as their supporters rather than on the strength of their evidence, and how in practice scientists often proceed intuitively, stylistically and illogically in the pursuit of the development of an idea. They also note the need to consider the role of aesthetics and career reputations in the success of a theory, the various difficulties involved in operationalisation (such as the varying definitions of the same term, the resistance to such definition by some concepts, and the complex inter-relationship between such terms), and the myth of the replicable study (where a replication is never merely that but usually involves some difference, usually an attempt at improvement).

Having thus provided evidence against the standard method, Machado et al. (2000) argue for a return to conceptual investigation (this not implying the exclusion of factual studies). I will come back to this important point later in this chapter, albeit in a way that differs from these authors, when I argue for the relevance of deconstruction for the current project. For the moment the above illustrates the limitations of claims to a universal method, and provides a critique of the attempt to bypass (or to take as resolved) the epistemological, ontological and ethical assumptions that found a particular set of analytical procedures. I will also return to this point again in the discussions that follow; first by referring to a

variation of *the* method, a stance I refer to here as 'guru-ism', and then arguing for a stance which opens up method by taking seriously the context of the project. Between these returns I will turn to consider methodological anarchism, a stance that is, in a reactionary way, the reverse of a heightened concern with a set of rules.

Variation 1: Guru-ism – Truth through fidelity

If methodolatry may be imagined as a formalised religion, then the variation I will be describing at this point could be considered a cult. What is referred to here is not the adherence to a universal method but the devotion to a more particular methodology (that is, one with institutional dominance), usually associated with a specific personality or school of analysis. Critical psychology (and no less mainstream psychology), for example, is known for the tendency for such categorisations and devotion, sporting a diversity of agents such as Foucauldians, Lacanians, Derrideans, Marxists, social constructionists, post-modernists, radical feminists, discourse analysts, post-colonialists etcetera.

Two points may be made here that helps strengthen the link I make between such a stance and methodolatry: First, various debates often arise amongst devotees about what is the true or correct reading of the master or approach's texts and methodologies. This then takes on characteristics of the practices associated with *the* scientific method, as noted earlier by Machado et al. (2000), that is, an ever greater concern with fine-grained technical debates, the establishment of artificial distinctions within the discipline, and the establishment of specialised journals that are increasingly isolated from larger debates, agendas and critiques. This process of potential isolation then leads to the second point, the danger of the rejection of other approaches and methods often based on a limited reading and understanding of such alternatives. This is typified by the development of a number of dogmatic responses and stereotypic retorts (including the use of auditory sighs, smirks and knowing glances to a confederate) when the name or a term from another thinker or approach is mentioned. The previous chapter may be read as a history of such dogmatic exclusions in the consideration of the body.

Of course this can be associated with a worse consequence; the loss of the critical agenda in general[2], that is, the forgetting of the larger pursuit of social justice whilst increasing energy is spent on specialisation. It is useful to wonder about the benefits of such a 'turning inward'; it would certainly offer the security of mastery, familiarity and community, and a measure of success as some status is achieved within such a stricture. The cost is, of course, significant as fragmentation leads to political disempowerment and pacification as energy is spent on local debates whilst larger exploitative processes continue unhindered. Again this is partially due to research questions that should lead the way being usurped by a concern with method.

To some this may appear to be a harsh reading of specialisation, since it tends to erase the hope, enjoyment, sense of empowerment, collegiality, and utility that a particular approach brings to those involved. However, this critique should not be read as the wholesale rejection of such devotion since where would such dismissal lead us except back to some sort of universalism or (as I will discuss shortly) anarchism. Furthermore, how are we to progress except through the exploration of writings considered significant by our colleagues and mentors? Rather the above should act as a call to be mindful of the seduction and security of such devotion and the need for those engaged in the critical project to continuously live in or return to the larger world and its violences.

The above dynamic should also be adhered to in the internal debates concerning the reading (interpretation) of seminal texts. On the one hand, such dialogues are immensely useful as the implications of these writings for practice are unpacked. For example, the radicality of a notion may be further developed by disentangling it from more conservative assumptions often imported to it from a different, usually earlier, school of thought. Two examples of this may be named in passing; the one is Hepburn's (1999) critique of the utilisation of Derrida's ideas in critical psychology, and the other is Butchart's (1997) similar criticism of the ways the work of Foucault has been taken up in socio-medical research in South Africa. On the other hand, as just mentioned and as will be developed in more detail across the next section of this chapter, such analyses should never be at the expense of the larger project.

[2] See Chapter 1 for a discussion of the 'agenda' of critical psychology.

Also, such debates should not be about matters of fidelity; that is, a naïve concern about what is 'really' meant by, say, Foucault in a particular paragraph or comment. This would then mark a lapse back into universalism and a pursuit of *the* interpretation or method. Foucault (cited in Scheurich & McKenzie, 2000, p. 861) provides the necessary response to such pursuits:

> The only valid tribute to [anyone's] thought … is precisely to use it, to deform it, to make it groan and protest. And if commentators then say that I am being faithful or unfaithful … that is of absolutely no interest.

Foucault's comment points to the necessary subservience of 'thought' (or in this context, 'method') to the task at hand, to the larger project. Although it would be simplistic to define a linear and unidirectional relationship between the research aim and the method (since the latter is always embedded in ontological and epistemological assumptions that always speak back to the former), the concern at hand should never become secondary to, or an illustration of, the method.

This part of the chapter is drawn to a close through a return to the previous point of fidelity. It is useful to dismantle this notion one more time by briefly noting Culler's (1982) simultaneous problematising of several distinctions: use and abuse, understanding and misunderstanding, and reading and misreading. Here fidelity returns as being able to correctly utilise a method or to truly understand (provide *the* reading of) a theory or the writings of a guru. Enlightenment or superiority is thus the demonstration of a perfect resonance with a body of work; a mastery of the master. The valued notions of understanding, use and reading all involve demonstrating identity or, in less strong terms, correspondence, whilst misunderstanding, abuse and misreading typically indicate difference (Culler, 1982). But as Culler, drawing on Derrida, points out, reading and so forth are always marked by modifications (non-identity, difference) as they are repeatedly demonstrated by a diversity of readers across different circumstances. This is because contexts are ever extendable[3], readings are always selective and varying in organisation,

[3] This point will be returned to and developed more fully later in the chapter.

and texts themselves are stunningly complex. This would then indicate that difference, rather than identity, is the norm when it comes to reading, using or understanding something. Or, to complete the inversion of the identity and difference binary, 'understanding' may be regarded as a special case of (a generalised) 'misunderstanding', that is, it is a misreading whose differences are taken not to matter.

The consequence of this is that no reading can ever be said to be final as new readings may emerge that highlight different features and indicate new implications which render earlier readings less acceptable, that is, they become misreadings (Culler, 1982). No reading therefore ever escapes correction as previous misses are identified and errors that were previously insubstantial now become significant. Similarly all understandings are moments that are waiting for their errors to be exposed. Although this indicates the contingency and circumstantial nature of understanding it does not eradicate the claim to truth[4], as this is the gloss (or shadow) that occupies every successful new reading. What this argument highlights is the socio-political context within which readings occur. It indicates the importance of an awareness of institutional processes of legitimation, validation and authorisation; the processes through which certain linkages, associations and meanings are instituted, naturalised and fall beyond question. This strikes a blow against a naïve pursuit of fidelity and, returning to the earlier claim, suggests that readings are perhaps best judged (as will happen in the final chapter) by asking what they bring to the addressing of larger concerns (such as those discussed in the opening chapter).

Anarchism[5]

Osbeck (2005, p. 8) contrasts methodological monism with, what he calls, 'epistemological anarchism', the latter being a reading of critiques of *the* method as implying that methodological standards are not possible and therefore such notions are to be abandoned wholesale. Thus, given that a universal method cannot be articulated, since there is 'no defensible or reasonable basis for any belief, evidence or progress', this means the end of

---

[4] This concept is also developed more fully at several points across the chapter.

[5] The term is used here to refer to 'disorder' or, more correctly, 'no order' and not to anarchist political philosophy which engages with and certainly does not reject forms of social organisation.

method as such (Yanchar et al., 2005, p. 36). A rigid rule structure is substituted with a set of procedures that adheres to no standards beyond itself, turning the research process into the equivalent of some sort of ahistorical free improvisation, a performance piece incapable of contributing to a larger project, such projects having been shown to be mythical.

Both Osbeck (2005) and Yanchar et al. (2005) regard such scepticism, also referred to as methodological nihilism or relativism, as founded on a simplistic reading of the critique of methodology offered by the philosopher of science, Paul Feyerabend. What is referred to here is that his claim that science cannot be guided 'by a set of predetermined rational principles' (Yanchar et al., 2005, p. 37) implies, not a criticism of a particular form of reason, but an abandonment of all such rationality in general. Osbeck (2005) argues that such a rigid distinction between rationality and anarchism resonates with a rational/social dichotomy, where science is either universal, formal and abstract (an instance of 'Reason') or it is a phenomenon reduced to nothing but rhetorical and social intrigue. All this then achieves is a simple inversion of the binary where the previous 'other' (anarchism) is celebrated whilst the former is vilified. The general order, the binary structure underlying such reasoning, is left unchallenged and the opportunity for a more radical transformation of rationality is lost. Clearly then a subtler (and more radical) reading is required of the failure to establish a universal method. Before attempting an initial outline of what such a posture may look like, I first turn to a variation on the above.

Variation 2: The turn to the particular

Wetherell (1999), in a critique of utilisations of Marxism in psychology, unpacks the various binary structures such articulations utilise, including the epistemological dichotomies of truth/falsity and real/illusory. She then goes on to argue for the utilisation of an ontology and epistemology based on the work of Foucault and post-structuralism. Such a paradigmatic framework (specifically drawing from the work of Derrida) is also adopted for this project and will be addressed in more detail later in this chapter. What I would like to focus on here is the danger of the above reading reinserting a binary; the distinction between universality and particularity.

Wetherell (1999) indicates that a turn to the above 'post-structural' framework would introduce a modesty that escapes the grandiosity of such theoretical projects as Marxism. Here she refers to the all encompassing ambition of these modernist ventures to account for everything; to sculpt *the* theory, the universal singularity. She then points out that such ambitions fail to recognise that 'something is always forgotten in intellectual work' and that to 'write at all is to forget and erase some possible ways of framing' (p. 405). Instead of holding on to such grand schemes we should then rather adopt an understanding of politics and the academic project 'as a more partial, incomplete, contingent and corrigible activity' (p. 405). Consequently research should focus on the 'empirical study of particular practices' (p. 404), on 'less refined, undignified and particular practices', and should quit emphasising protracted philosophical discussions about realism and relativism.

Thus a series of injunctions are provided here by Wetherell (1999): i) abandon naïve notions of general theory, ii) focus on the local and the particular in your research, iii) research should be empirical not conceptual, and iv) combining the above, stop getting involved in conceptual debates that draw the researcher away from particular and empirical projects. There appear to be some interesting similarities between such a set of guidelines for proceeding and the approaches previously discussed: Here we have both the emphasis on the empirical and the marginalising of the conceptual described by Machado et al. (2000) in their critique of methodolatry, and an emphasis on the contingent and suspicion of the general associated with anarchism.

Several points may be made in response to this: In emphasising the particular, the local, and the empirical in the way she does, does Wetherell (1999) not risk reinserting a set of binaries that she wishes to escape; the general/particular, global/local, and theoretical/ empirical. First, does she not rely on general assertions about reality in order to ground her claims of the salience of local projects? For example, she identifies core notions such as 'ideology' and 'interpretative repertoires', and specifies our task as being the identification of 'how truths are produced' (p. 404). It is not possible to argue for an emphasis on the particular without then stepping beyond this restriction to utilise the realm of the general. Second, she surely would not be suggesting that we adopt a naïve empiricism when

engaging in for such studies? As Machado et al. (2000) have pointed out; the conceptual work required for empirical projects is unavoidable. There is an inescapable intimacy inherent in the theory/empirical binary - which will be discussed in more detail later in this chapter. And, finally, does Wetherell (1999) not herself step back into philosophical debate and the realist/relativist binary when she criticises realism in the same article?

There is thus a difficulty involved here: Our conceptual inheritance consisting of various binary oppositions cannot be escaped; an emphasis on the one side seems to only bring us face to face with the term we would like to counter. We may call for the emphasis on one aspect of the binary on good conceptual and ethical grounds but may never escape the encompassing binary structure. Clearly then a careful logic and procedure is required when dealing with such endeavours. I return to this in the next section in the discussion of the strategies of deconstruction. At this point the intricacies and trappings of methodological postures based on universal and particular ideals have been illustrated. Next I turn to a final approach, that of critical method, which attempts to find a way beyond such problems. I draw here from the work of both Osbeck (2005) and Yanchar et al. (2005) but then, in the final part of this chapter, read their prescriptions through the logic of deconstruction to provide a clearer description of the 'method' adhered to in this project.

Critical method

As has been discussed, both Osbeck (2005) and Yanchar et al. (2005) express misgivings about method understood as rigid recipe or as complete rebellion. Instead they both call upon the use of creativity when conceptualising the procedures for any particular project. The nature of such 'creativity' for each is discussed below.

Osbeck (2005) highlights the theme of innovation by viewing method as having to assist in the development of new directions for thought and activity; it is that which allows effective thinking and communication. In order to achieve this, what is required is an explicit inclusion of those aspects typically expelled in postures that pursue articulations of *the* method, whether tied to the universal ideals of pure science or the agendas of particular schools. He thus refers to the need to return intuition, imagination and contextual

sensitivity to the reasoning involved in developing methods. What is required is a method 'inherently relational, historical, developmental, rich with imagination and ethical concern' (Osbeck, 2005, p. 19). So ethical issues are placed in the foreground providing a point of connection with a psychology concerned with social justice. The social aspects surrounding the emergence of classic works are explored by Osbeck (2005) and he emphasises the importance of both critical discussion and the need to consider the influence of methodological fashions, dominant paradigms, and institutional power relations.

Yanchar et al. (2005) echo the above inclusions by linking method to the use of an 'informed imagination' (p. 34), one conversant with the topic under exploration and able to use these insights in sculpting the research process. As a result there is a commitment to flexibility, reinterpretation and innovation in the utilisation of method, Yanchar et al. (2005) linking these activities to the advances of science. For them, research should be question driven and based on the development of strong arguments and the provision of multiple forms of evidence. Furthermore, there can be no single method that can assist in the answering of all questions; the question of methodology remains always open. Here method is defined as 'a contextual and evolving theory of enquiry' (p. 35). This highlights that methods are theoretically embedded and constructed upon epistemological and ontological assumptions. Yanchar et al. (2005) unsettle all levels of the research process (including the research object, method, and underlying theory and assumptions) by allowing no privileged ground, no space that is beyond continuous critical examination. No approach is sacred and there is an explicit call to beware of dogma, of silently passing over any aspect of the research process and structure.

The devotion to flexibility advocated here requires both the development of strategies that best address the matter at hand and a casting open of what counts as evidence. Hence traditional criteria for rationality, such as empirical substantiation, logical coherence, internal consistency, and parsimony, are aligned with less traditional notions such as ethical defensibility, potential for new perspective and insights, and the ability to solve problem situations (utility). The strategies used to investigate a phenomenon and the arguments used to support a stance are also cast open as 'assumption based, value-laden, historically

contingent, fallible, modifiable and evolving' (p. 38). These assumptions in turn should be open to question in terms of their persuasiveness, moral defensibility, ability to create positive change, and capacity to speak to human experience.

Essentially then method is opened up and removed from a formalised and acontextual procedural logic. Such procedures may be adhered to in a particular venture but should never rise above examination and accountability. Method, in contrast to the stasis sought for it in universal projects, is cast in motion, a morphing set of strategies, arguments, and justifications that is subservient to the consideration of a 'problem of genuine consequence' (Robinson, cited in Yanchar et al., 2005, p. 43). This emphasis within methodology on philosophy and conceptual examination allows a turn to the particularity of a question and area of investigation that does not leave general claims beyond inspection. This bears a resemblance to the arguments concerning misreading where method may be considered appropriate at one point only to be rendered inadequate by a later examination. It is to this unsettling of method, displacing it as 'method', simultaneously tied to the transcendental and the empirical, to the general and the particular, to which I return in the next section. To close this segment and in order to provide a further clarification of the above I now briefly turn to a set of useful distinctions provided by Olivier (2007).

Modernism, post-modernism, post-structuralism

Links may be drawn quite directly between methodolatry and modernism and anarchism and post-modernism, whilst the critical approach to method described above will need further articulation to make its association to post-structuralism clear. Olivier (2007) describes the modern and post-modern as 'structural features of culture' (p. 5), noting that they manifest historically and are tied to specific western cultural historical developments but are also separable from each other by bearing structurally distinct elements.

Modernity involves the pursuit of a strictly rational understanding of the world wherein the identification of concepts of universal application is paramount (Olivier, 2007). The intent is the promotion of science as providing control over nature and society. The emphasis on the sculpting and correct utilisation of a universal method associated with methodolatry

then falls in line with such an agenda. Postmodernity, in contrast, represents a rejection of the universalising agenda of modernity and emphasises the particular over the universal. Here then 'tremendous attention is given to diversity, difference and otherness' (Olivier, 2007, p. 2). Given this, a link may be drawn between such an emphasis on particularity and the pursuits of methodological anarchism.

For Olivier (2007), post-structuralism is distinct from both modernism and postmodernism in that it slips beyond the strictures of the universal/particular binary which are represented by the two agendas. In order to unpack this claim this will first require an articulation of the 'method' of deconstruction which will then allow me to return to the emphasis on critical methodology and conceptual investigation provided above.

THE UTILITY AND SPECIFICITY OF DECONSTRUCTION

Conceptualising deconstruction

For the French philosopher, Jacques Derrida (1930-2004), the person with a method is 'irresponsibility itself' (Beardsworth, 1996, p. 4). There are several reasons for such a claim, already echoed in the previous section: i) there is the potential absence of a contemplative stance since such a person is already sure of how to proceed, ii) there is the danger that the purpose of enquiry will be lost through an adherence to procedure, and iii) a variation on the first point, being rendered compliant to methodological criteria, the person takes on the status of an automaton. But beyond this concern with deconstruction being reduced to a simple matter of application, and so forsaking responsibility, it is also not a method for this implies something that is closed and terminable; a formula (Royle, 2000). Thus circumscribed it is rendered safe, containable, static, and institutionalised. As will become clearer, deconstruction is not something that can be formalised, anticipated, or predicted; it remains, instead, incalculable and interminable, always on the move, changing as it multiplies across the contexts of its use.

To engage with deconstruction is to engage with a dilemma, an aporia (Hurst, 2004). As Royle (2000) states; 'deconstruction is… undecidably performative and constative' (p. 10).

To simply apply it as a method (deconstruction as code) is to loose it, whilst to abandon all structure (deconstruction as spirit) is also to loose it. It thus cannot be equated (reduced) to either procedure or attitude; but is both code (a set of possible strategies) and spirit (that which exceeds any structure). Therefore we must proceed responsibly, cautiously and humbly knowing that the matter at hand exceeds the strategies available. This then requires innovation, flexibility, interpretation and a love of surprise. Given this, Derrida states that the least toxic definition of deconstruction is that it is 'the *experience of the impossible*' (cited in Royle, 2000, p. 6, emphases in original). Here this aporetic relationship is acknowledged by placing 'method' within quotation marks[6].

The above means that, strictly speaking, deconstruction cannot be defined since it is neither an entity nor a univocal or unitary set of procedures (Critchley & Mooney, 1994). To claim that deconstruction *is* something is to miss an important point (Hepburn, 1999). Such a definitional project represents a set of ontological moves that Derrida would like to avoid; to define is to attempt to establish an equation, a fixed link, an unquestionable truth, or foundation. Such a search for stability or, to use Derrida's term, 'presence', is a tendency traceable across the history of Western philosophy, a tradition which Derrida seeks to unsettle. Hepburn (1999) describes the attempt to define deconstruction as one side of a polarised description, either to render it as a concrete set of procedures or as an ethos of 'anything goes'. This of course evokes the methodolatry/anarchist distinction previously discussed. It is rather *these* attempted reductions to sides of an established binary opposition that are troubled through deconstruction.

It is important to recognise that any reading of this 'method' will seek to establish some standard for its use, attempting to render variations as misreadings, as distortions (Culler, 1982). But such articulations are then themselves open to a return of the excluded which may render its authority obsolete. It is then in this very process of repeated articulation (reiteration) and, more importantly, utilisation where readings (of the 'method' of deconstruction) are established, contested, and new readings validated that deconstruction

[6] This indicates method as *sous rature*, under erasure, which is often indicated by crossing out the word whilst still retaining it in the text.

comes into existence. Given this, I will nevertheless attempt to provide a reading of deconstruction that will then run the risk of being read as method. Taking Derrida's warning concerning method and Yanchar et al.'s (2005) argument for its contextualisation seriously, this search for recipe (method) can be countered or unsettled by continuously keeping in mind that here is sought its *particular* application in the context of this project ('method'), where the purpose of enquiry must continuously remain visible. Furthermore, utilising Macleod's (2002) practice, what will be sought here is a 'conceptualisation' of deconstruction, rather than a 'definition' given the latter's 'impression of definitive closure' (p. 17).

Whereas Hepburn (1999) refers to deconstruction as a 'set of textual procedures' (p. 640), Culler (1982) points out that it is not to be understood as 'a specialised set of discursive procedures' (p. 156). Given that his next point is that deconstruction is not 'the rules of a new hermeneutic method... in the shelter of a given and stable institution' (p. 156), his statement may be read as an injunction against using the notion of 'procedures' as linked to an established (institutionalised) method. That deconstruction at all times involves texts is however clear since, as Johnson (1981) points out, deconstruction is a 'type of critical reading' (p. xiii) (or in Culler's terms (1982), 'a style of reading' (p. 213)) that is always 'inscribed in the margins of some pre-existing text' (p. x). However, what is implied by 'text' is a vital issue and will be discussed later in this chapter.

Deconstruction should be a form of critique (Johnson, 1981), but as such its 'method' should not be associated with several typical actions. Critchley and Mooney (1994) develop a negative conceptualisation by identifying activities which deconstruction is not: It is not a practice of demolition (destruction), nor is it a reductive form of analysis. It is not a critique in the sense of the imposition of universal (outside) standards on a text, that is, the standards of *the* method. Rather, drawing these two statements together, it tends to work within (the logic or assertions of) the text, not destroying it or reducing it to a set of essential themes, but stressing the latent disruptions intrinsic in the text (Hepburn, 1999). These disruptions are used to displace the text's meanings, to redeploy them so as to bring to light unexpected effects and consequences (Culler, 1982).

The above radical orientation to meaning and language requires the use of a variable set of strategies and tactics for the reading of texts (Hepburn, 1999; Johnson, 1981). Deconstruction is typically (although not solely) regarded as an intervention in the field of oppositions, a discursive feature which Derrida associates with the metaphysical tradition that permeates Western thought (Culler, 1982). What is meant by metaphysics will be explored shortly, but for now it is for us to note that deconstruction characteristically (formulaically) involves an attempt to 'undo' the binary oppositions upon which (the various assertions of) theories depend.

This identification of the binary structures inherent in a text is but the first part of a characteristic deconstructive reading (Culler, 1982). What follows is a double movement where such binaries, which Derrida indicates are always hierarchically structured, are inverted and then, most importantly, the implications of such inversions are rigorously explored and articulated (Hepburn, 1999). What emerges is not only a displacement of meaning (and thus the theory under investigation) but, since we are dealing with hierarchical structures, it is the disarticulation of a dominant mode of signification (rationality) (Johnson, 1981). Thus critically deconstruction is a disruption that has institutional and political consequences. This point will be developed later but for now it is important to note that such a critical reading does not attempt to abolish the binary structures at work in a text; that is, the aim is not to create some form of general and undifferentiated textuality (Culler, 1982). A disruption of meaning does not intend some form of textual or, rather, semantic defacement, where the inscription of meaning becomes impossible (Johnson, 1981). Rather deconstruction works from within such a binary logic which metaphysics has utilised in attempts at semantic closure; the fixing or entrenchment of certain meanings. This then distances it from more post-modern monistic ideals, where a politically naïve relativism is assumed.

Having provided a broad initial conceptualisation of deconstruction, the rest of this section will now develop several themes: This includes a description of Derrida's critique of the metaphysical tradition which then allows the introduction of the important 'concept' of

archi-écriture, one of the many 'undecidables' that Derrida has articulated in his various readings. The epistemology and ontology of deconstruction is then addressed, allowing for a series of comments on its relationship to such core notions as 'truth' and 'interpretation'. From here the relationship between deconstruction and the text may be further developed, which will be followed by a brief coverage of some of the strategies associated with this 'method'. The section closes with a discussion of the issue of deconstruction and politics. After this, in the penultimate part of this chapter, a particular characterisation of deconstruction will be addressed. Here specific attention will be paid to the core binary opposition (especially within the context of this project's concern with materiality and the body) of the theoretical/empirical, the relationship between the word and thing.

Metaphysics

For Derrida, Western philosophy has been dominated by the logic and structure of what he calls 'metaphysics' (Hepburn, 1999). Here philosophy may be read in two senses; narrowly as a discourse gleaned from a fairly circumscribed set of texts (those referred to as 'Philosophy') or, more broadly, as a feature of all discourse (Hurst, 2004). Here discourse 'is inherently philosophical to the extent that it "means to say" anything at all' (Hurst, 2004, p. 261). To escape from philosophy, within the broad strictures of the latter formulation, would then be to either fall absolutely silent or to engage in absolute jabber. Consequently, every act of meaning, every attempt to say something, places us within the bounds of philosophy and the metaphysics to which it is subjugated. To speak is to then be caught in structurally articulated oppositions, paradoxes and aporias that come with using language. Metaphysics may be understood as an attempt to erase or control the complexity that comes with each endeavour to say something (Culler, 1982).

The metaphysical tradition is characterised by an idealisation referred to as logocentrism (Culler, 1982). Logocentrism may be understood as the attempt to specify foundations upon which to proceed, the effort to establish the presence (unquestionable existence or full Being) of certain notions, the endeavour to find transcendental signifiers (meanings that stand outside of the disruptive play of language, that are prior to and transcend signification (Spivak, 1974)) in order to establish *the* order of meaning. Derrida reads metaphysics as an

attempt to not only control the effects of signification but to erase language so that it becomes a transparent means of representing reality (itself assumed to be fully present). The world may then be depicted unsullied by the disruptive effects of language, words become the invisible vehicles for the depiction of meaning (Hepburn, 1999).

Within the scope of such an ambition Derrida identifies speech as being the privileged term in opposition to writing. It is speech which is depicted in the Western philosophical tradition as being closer to meaning, and writing which is cast in a supporting and, importantly, distorting, role. Within this tradition writing should not be allowed to infect meaning, but should ideally provide the pure representation of the thing under consideration (Derrida, 1986). The alignment of the materiality of speech with transcendental meaning is the result of what Derrida calls the system of *s'entendre parler* ('to hear/understand oneself think') (Hepburn, 1999). Since understanding and hearing oneself think appear to be simultaneous it would seem that in speech we achieve a remarkable intimacy with meaning, a place where the signifier (the sound) and the signified (the meaning) coincide. Here then is a place where we have the 'direct presence of a thought expressed in speech' (Hepburn, 1999, p. 345). This privileged status given to speech (and its supposed characteristics) is, as we will see, an illusion (Culler, 1982). But for now we can note that the Western tradition is typified by this privileging, or what Derrida calls phonologism (Derrida, 2004).

Given the above, and following on from the introduction, what emerges is that Western thought is structured in terms of polarities (Johnson, 1981). It is thus notable for the presence of binary structures such as truth/error, nature/culture, and, a central focus in the opening chapters of this project, body/mind and mind/matter[7]. The important point about this binary structure is that it is not a neutral or a simple opposition; it is rather structured as a hierarchy where one of the two terms takes priority both temporally (it precedes the other) and qualitatively (it is superior to the other). This superiority is in terms of the dominant

[7] To this may be added a range of other common binaries including first/last, here/now, I/you, unique/ repeated, author/reader, beginning/end, and, echoing the above, sensible/intelligible and ideality/materiality (Johnson, 1981).

term being considered as a better representation of, or being closer to, reality (Hepburn, 1999). The other, as we saw in the above example of speech and writing, is considered to be inferior, a corrupting influence, and ultimately dispensable. As will become clearer in the next section this monism (in that the other is marginalised and trivial leaving only the primary term fully present) disguises a deep reliance on the excluded term.

What emerges as the fundamental binary within Western metaphysics (of which speech/writing is used by Derrida as a prime example), is that of presence and absence (Johnson, 1981)[8]. Presence, both spatially and temporally, may be aligned with a number of terms including being, form, entity, essence, identity, immediacy, life, and unity, whilst absence may be associated with terms such as the accidental, the indefinite, death, deferral, difference, dissimulation, distance, and formlessness. The Western philosophical tradition *desires* presence[9] (which, of course, then indicates that what is encountered is the lack of such presence and that the claimed ontology is actually absent) (Johnson, 1981), this resulting in practices that seek the 'reduction and domestication of otherness' (that is, mastery) by reducing plurality to unity and alterity to sameness (Critchley & Mooney, 1994, p. 448). As Nietzsche pointed out, philosophy is the 'active indifference to difference' (Derrida, 1982, p. 17).

Following from this, 'Truth' is understood as that which is untarnished by language and equivalent to those meanings which remain constant across appearances, those presentations that are repeatedly and 'objectively' observed, that is from a place outside of the world. A host of terms are then privileged within this realm of presence: the literal over the metaphoric, science over rhetoric, philosophy over poetry, the host over the parasite, the essential over the marginal, the serious over the comical, and the universal over the contingent (Culler, 1982). It is not difficult to recognise those notions remaining after the others have been (and continue to be ritually) cast out as being those concepts valorised

[8] Staten (1984) points out that the emphasis on writing has lead to a discursive reductionist misreading of Derrida (allowing him to be discarded) where it is the notion of 'form' and its link to presence which for Derrida inaugurates metaphysics. Metaphysics thus bears 'the decisive mark of Aristotelianism' (Derrida, cited in Staten, 1984, p. 5). See discussion of Aristotle's notion in Chapter 2 as well as Bennett and Hacker's return to his notion of form in their critique of the mind/body binary.

[9] What Spivak (1974) poetically refers to as 'an ineluctable nostalgia for presence' (p. xvi).

within the contemporary discourse of science, that inscription to which neuroscience dogmatically prescribes.

Archi-écriture

As indicated above, Derrida traces across the history of Western philosophy a privileging of speech and a systematic marginalisation and repression of writing (Derrida, 2004; Norris, 1982). Here it is speech which lies in a naturally closer relationship (as indicated in the previously mentioned system of *s'entendre parler*) with meaning, and it is writing which is a secondary practice on which we rely in a mere practical sense (that is, to save meaning in the form of texts), but which brings with it loss and the threat of distortion (Critchley & Mooney, 1994). After identifying this hierarchical binary at the heart of philosophy, Derrida proceeds to invert this by demonstrating the reliance of speech on writing. In such a deconstructive move, '[w]hat is proposed as a given, an elementary constituent, proves to be a product, dependent or derived in ways that deprive it of the authority of simple or pure presence' (Culler, 1982, p. 94). In demonstrating how the dominant aspect of a binary relies on a subjugated element of the discourse in which it is embedded, the central notion of metaphysics, that of presence, is troubled; its autonomy and primacy are disinterred as its reliance on a secondary element is demonstrated.

This inversion is however more than a simple re-arrangement within the same logical order, since – if its implications are carefully traced and the lure of metaphysical closure avoided – a displacement of this order emerges. Using a political analogy; it is not simply the case of a dictator being usurped by another dictator where the same political system remains intact (a coup) but, rather, a revolution in its ideal sense, where the replacement brings about a change of the entire political order. Thus Derrida inverts a binary not in order to retain a metaphysics of presence now under a new name (writing), where the same problematic logic and ambition is kept in place, but to displace this entire tradition so as to reveal that presence itself was an illusion which relied on a more generalised structure of writing; an underlying order of difference not where absence is now king (which would retain the absence/presence binary at the heart of metaphysics), but where both presence and absence emerge from the play of difference, a writing-in-general, an *archi-écriture*

(Hepburn, 1999). To recognise the displacement of phonologism it is important to realise that Derrida does not refer here to writing in its narrow sense, that is, the markings of an implement on a surface, but instead identifies a more fundamental order which shares a lot in common with the practice of writing. Thus speech, the emblem of presence, is not a transcendental signifier, but is itself an illusion, a product of writing in a general sense, a fundamental order of difference where the notion of presence cannot hold and, consequently, the ambitions of metaphysics are undone.

Derrida traces this privileging of speech across the work of various philosophers, including Plato (Culler, 1982; Derrida, 2004), Aristotle (Derrida, 2004), Rousseau (Culler, 1882; Derrida, 2004), Hegel (Derrida, 2004), and Husserl (Critchley & Mooney, 1994; Derrida, 2004; Flynn, 1984). In each case the glorification of speech and the vilification of writing are demonstrated despite the contradictory presence within the self same text of a reliance on the latter. Thus the presence and limits of the ambitions of the metaphysics of presence are revealed. Here a more grounded example of this deconstruction of phonologism will be provided by detailing Derrida's deconstruction of the conceptualisations of the Swiss linguist, Ferdinand de Saussure (1857-1913) (Beardsworth, 1996; Culler, 1982; Derrida, 2004; Norris, 1982).

A point prior to proceeding: Derrida speaks of a discourse deconstructing itself rather than it being deconstructed by some outside force (Culler, 1982). This reaffirms the earlier point that one works from within the limits of the text, within its *particular* assertions, binaries, arguments and contradictions, when engaging in deconstruction. The ground for the deconstruction of a text is the very ground upon which its claims are built. As also previously indicated, such an analysis does not pursue the destruction of the text but instead the affirmation of the radical potential of the work under consideration.

Saussure conceived of language as a system of signs, where the sign is understood as constituted of the signifier (the acoustic image) and the signified (the concept) (Gordon & Lubell, 1996). As Derrida (2004) points out, Saussure meant these two terms to be considered inseparable and not in the form of a distinct duality such as in the Cartesian

binary of mind/body. Next, for Saussure there are no essential connections between images and concepts, any linkages between signifiers and signifieds are arbitrary and conventional, determined entirely within the contingency of a particular language community (Culler, 1982). Also, terms are defined by difference, that is, meaning emerges not as the result of something intrinsic to the term itself but as the result of a set of extrinsic differences between a particular term and other terms. There are thus no positive terms as such.

Saussure distinguishes between speech events or utterances (*parole*) and the system of language (*langue*). The former, a temporal element since speech occurs across time (diachronic[10]), makes the system possible – no speech, no (instantiation of the) system (Culler, 1982). The latter, a system of differences present at any one point in time (synchronic), makes meaning possible – no system, no (meaningful) speech. The radical aspect proposed here by Saussure, which challenges the emphasis on presence (positivity) in metaphysics, is that meaning emerges diacritically, through a system of differences. The presence of meaning is thus not of a positive variety; the sign is instead constituted by *the trace* of other signs, these referring to other signifiers, ad infinitum. This formulation disrupts (or exceeds) the present/absent binary in that meaning is never simply present since its meaning is constituted by absent signs, but neither is it simply absent since there is, after all, the effect of meaning. The tapestry of linkages that this conceptualisation suggests is what Derrida (2004) refers to as 'text'. I will return to this notion later.

Another important critical moment for Derrida (2004), one that again undermines the metaphysical project, is where Saussure desubstantialises 'both the signified content and the "expressive substance"' (p. 18), in that he states that the material element cannot belong to the system which, given the previously mentioned intimacy of the sign, means that the signifier cannot be simply equated with the phonic. The acoustic image and concept, the signifier and signified, are both meant as *mental* entities (Gordon & Lubell, 1996). Although this renders both as psychological phenomena and thus evokes all the problematics of the mental/material distinction, this claim does dissociate the theory from phonocentrism in that sound cannot be part of the system (Beardsworth, 1996). But as

[10] Here is not meant diachronic analysis, that is, the analysis of the development of a language over time.

much as the above subverts the metaphysics of presence, the reader may already be aware of how this framework is also already phonologism's affirmation.

Derrida points out that Saussure's notion of the sign is still entrenched in metaphysics: The signifier/signified (where the latter may be read as 'concept', 'meaning', or 'transcendental signified') is based on the sensible/intelligible binary in that the former exists as the mental entity that gives access to the latter (Culler, 1982; Derrida, 2004). It also begs the question, given that the sign is so radically located in a psychic realm, of how material variations are able to be significant? In order to be able to investigate this would it then not somehow require that we be able to grasp signifieds directly? But, if so, how would we be able to do this given that the only access to the mental is through the material?

Furthermore, in Saussure's work we once again find the vilification of writing (Culler, 1982; Derrida, 2004). Writing is secondary and derivative, corrupting and dangerous. Unlike speech which is in direct contact with meaning, writing is the imperfect representation of speech, separated from the semantic origin and the presence of the speaker. Here again we find the positing of a natural link between thought and voice, between meaning and sound (Derrida, 2004). In this way Saussure, despite his radical departures, reaffirms the logocentrism and phonologism of the metaphysics of presence.

What emerges then from Saussure's framework are two contradictions (Beardsworth, 1996): i) He uses writing as that which best illustrates (exemplifies) the nature of language, that is, a system of originating differences (Culler, 1982; Derrida, 2004). He thus posits a radical inversion where speech may be best understood as a form of writing (Culler, 1982). Writing does not represent speech but rather speech is always already writing. And yet, despite his commitment to the diacritical process embodied in *langue*, he returns to a phonologist emphasis on speech (*parole*) and the pathologisation of writing (Norris, 1982). ii) Saussure makes it clear that the relationship between the signifier and signified is arbitrary and unmotivated and that the sign is not related to speech. And yet he places the phonic as prior to and naturally linked to meaning unlike the graphic signifier. Such a claim both contradicts the emphasis on arbitrariness and for Beardsworth (1996) reveals the

institutionalisation of linkages, the political aspect exposed by Saussure's work, a point that will be returned to later. For now we may note that the critical contribution of the arbitrary is abandoned in moments for the re-insertion of a binary hierarchy (Derrida, 2004).

In terms of the 'method' of deconstruction, contradictions such as these are essential since they set up a *dislocating tension*, one that can be used to open up the text; allowing displacements, transformations, re-inscriptions and new configurations (Derrida, 2004). Saussure represses the notion that language can in fact exceed the limits of speech and presence – the metaphysical doctrine of his time (Norris, 1982). If he should follow through on the radical aspects of his theory, this will actually lead him beyond the metaphysical sign, on which his 'science of signs', semiology, is based, to an engagement with the trace or gram, a 'science of writing-in-general and textuality', that which Derrida (2004) calls *grammatology*.

Here the signifier/signified distinction would be rendered problematic as we realise that every signified is itself in the position of a signifier, pointing forever beyond (Derrida, 2004). The static, synchronic, and ahistorical notion of structure (the atemporal *langue*) associated with semiology is abandoned for the discourse of grammatology and its notions of *archi-écriture*, text, gram and, a notion that will unpacked shortly, *différance* (Culler, 1982). The binary logic of logocentrism is undermined, the search and desire for presence abandoned, as a more fundamental landscape of difference, of simultaneous absence and presence is revealed. Here we find an originating substance that has no centre but evokes a momentary presence through a process of dispersal. Language, as one code amongst many, as a play of differences, forever on the move, precedes the binary abstractions which metaphysics has utilised; such as subjectivity and objectivity, empiricism and theory (Derrida, 2004; Wilson, 1998). This *archi-écriture* precedes the author and agent, it is what enables such agency, meaning, and presence, whilst simultaneously being that which disrupts and undermines it.

In closing this sub-section, I will re-iterate some of the points made above by unpacking Derrida's 'notion' of *différance*. This is probably one of the best known of his

'undecidables', which includes the 'trace' and 'gram' mentioned above and others such as the 'hymen', 'supplement', 'play', 'spacing', 'gift', 'aporia' and 'pharmakon' developed across his various works (Derrida, 1982, 2004; Hurst, 2004; Johnson, 1981; Wilson, 1998). These 'concepts' all trouble the binary logic of metaphysics, with its emphasis on an either/or or neither/nor logic, where meaning is either fully present or absent, in that these notions shimmer across the binary distinction with a logic of both/and. Across his writing Derrida repeats this disrupting logical 'form', but it is a repetition that differs between readings (re-iteration never simply bringing identity but always disrupted by difference) (Hurst, 2004). Thus he generates a range of context-specific nicknames resulting in an ever growing 'number of nonsynonymous substitutions' (Derrida, 1982, p. 12).

For Cilliers (1998) Derrida introduces the 'concept' of *différance* in an attempt to present language as a complex system. As made apparent in the work of Saussure, central to understanding this notion is the idea that language, as a system, is marked by difference. It is a temporal and spatial process of difference that Derrida attempts to capture in the 'concept' of *différance*. But why then use such a different word[11]? The term involves a play on two meanings of the French verb, *différer*, which in English means to defer or to differ (Derrida, 1982). One of the things that Derrida achieves by playing on this ambiguity is to simultaneously highlight the various dimensions of *différance*[12].

To *defer*[13] means to 'put off to a later time' (p. 216), to postpone (Sykes, 1978). This is the temporal element, which highlights the absence of absolute presence Derrida locates in language as a system. The meaning of a word is never fully present, not in a fully positive

[11] *Différance* is comprised of a conflation of two words; *différence* (difference) and the present participle of *différer*, *différant* (Derrida, 1982). The 'incorrect' spelling of *différence* is only apparent when read and not when spoken. In this way the term acts as a reminder of the subjugation of speech by the *archi-écriture* (Derrida, 2004).

[12] It also hints at *deference* (*déférence*) (French-English Dictionary, 1999), a meaning that becomes apparent towards the end of the section, in the sense of all signs being subjugated (constituted) by all other signs (Cilliers, 1998).

[13] Reference may be made to the Freudian reading of *différance* (as deferral) as a manifestation of the reality principle: The (unavoidable) deferral of pleasure. Pleasure as always deferred, the plenitude that is promised (or is remembered as lost) but never regained. In the same way, the full positivity of meaning as never fully present or absent, the promise of its coming (or return) keeping the system in play.

sense anyway. A sign always points elsewhere, to other signs that promise to reveal its meaning. But to pursue this chain of meaning will not lead us to any final set of core signifiers (an origin, the transcendental signifieds) on which a signifier can be finally grounded or fixed. These signifiers only lead to other signifiers which are linked to further terms and so on. Thus the meaning of a term is never fully present; it is always deferred, put off till later. The presence of meaning is a shimmer of deferral that runs off into the future (and yet has enough stability or presence to enable meaning and communication). The spatial image of a web of linkages is useful here. The second term, *difference*, already touched on to some extent, is indicated by Sykes (1978) as 'non-identity, unlikeness, point at which things differ' (p. 232) and introduces a spatial element. Signs contrast with each other. The idea of difference, of one thing being *other* than another thing, only emerges in comparison. Difference only emerges in relating one thing to another. Here the relational element of language is highlighted by Derrida; a sign's meaning only emerges through its difference to other terms. It cannot, in and of itself, be different.

Thus 'all signs are constituted by a system of differences' (Cilliers, 1998, p. 44). What *différance* enables is the simultaneous presence of the spatial and temporal aspects of this play of differences. Meaning arises across time and space and is never fully present (in the same way as all other meanings are never fully absent), but always deferred, always in relation to, and enabled, by the different and the elsewhere. It is this presentation of the four dimensions of space and time that also infers the materiality of the world and, within the scope of this project, the materiality of the nervous system.

Two final comments on the notion of *différance*: The first refers to the passive/active nature of the sign[14] in such a system and the second, to the instability inherent in such a play of differences (Cilliers, 1990). The sign is both passive, in that it is constituted (or subjugated) by other signs, and active, in that it plays a role in constituting (subjugating) other signs. It is also passive in being part of a web of synchronous differences and active as a passing on or putting off, a deferral. Furthermore, the endless play of difference that

[14] For Derrida (1982) the ending *–ance* of *différance* undermines the active element of *différer*, thus leaving the term suspended between activity and passivity.

determines the meaning of the sign also implies that the sign is marked by instability. The endless play of deferral and difference engenders a continuous shift in the meaning of the sign, even if, as Cilliers states, it is only 'imperceptibly' so (1990, p. 4). This should resonate with our everyday experience of language as we are aware of how the meaning of the words we use often shift dramatically over time (history) and space (community). An example would be the term, *personality*, a legal term in the last century, which has become a contemporary psychological term (Danziger, 1997).

The above articulation provides an example of deconstructive analysis and enabled an introduction to the notions of *archi-écriture* and *différance*. This provides the basis for a discussion of the epistemological and ontological aspects of deconstruction before moving on to a discussion of the more practical and strategic aspects of this 'method'.

The epistemology and ontology of deconstruction

Typically, any method, even one as decentred as the 'method' of deconstruction, has to make reference to its ontological and epistemological assumptions, that is, what does it claim is the nature of reality (or, more classically, what kind of fundamental things exist in the world) and what is the nature and limits of knowledge (what and how can we know the world) (Jary & Jary, 2000). That is, every 'method' is theoretically embedded and posits or assumes notions of reality and knowledge. In the case of deconstruction we can expect that the relationship between knowledge (expressed in discourse – the word) and ontology (as the world – the thing) will not be one of simple distinction.

One way to unpack these notions is to refer to two famous statements by Derrida: '*il n'y a pas de hors-texte*' ('there is no outside-text') and '*il n'y a rien hors du texte*' ('there is nothing outside of the text') (Derrida, cited in Critchley & Mooney, 1994, p. 445). The former may be understood as an epistemological comment in that there can be no order of meaning (knowledge) that stands outside of the world as such or, following from the previous discussion, outside of the play of *différance*. This implies Derrida's general critique of the metaphysics of presence which seeks to establish the order of meaning, the realm of transcendental signifiers that transcend the disruptive influence of the *archi-*

écriture. There can be no hope of establishing an order of signs that are self-referential, that achieve presence, and can universally and permanently ground the knowledge project. Absolute objectivity is thus a dubious claim, one that should be treated with suspicion, since it seeks to forget the disruptive play of the trace and the ravages of temporality[15] (Beardsworth, 1996). Knowledge is then not to be understood as the systematic tracking down or unveiling of a hidden truth[16] (*aletheia*), or presence, but rather as 'a species of *bricolage*', that is, 'a field of infinite substitutions in the closure of a finite ensemble' (Spivak, 1974, p. xix-xx). Derrida (2004) speaks of an 'old cloth that must continually, interminably be undone' and that 'this interminability is not an accident or contingency; it is essential, systematic and theoretical' (p. 22).

Applied to deconstruction itself, Derrida's statement may also be read as an indication of how the 'method' does not engage in the naïve desire to escape from the metaphysical tradition. For better or worse we must operate within the language of Western metaphysics (Derrida, 2004). As previously stated, the aim of deconstruction is not to establish a new order, an outside-text which takes the form of an undifferentiated and general textuality (Culler, 1982). Deconstruction has to operate within the metaphysical enclosure, within the binary oppositions that typify our everyday language, within the reality of our inheritance (Bennington, 2000). The aim is however not to re-assert this metaphysics, to allow ourselves to be enclosed, but to engage in the endless task of *opening* up the texts we analyse (and utilise) to new configurations, to unexpected consequences and implications, that render pathways to new understandings and actions.

With regard to Derrida's second statement ('there is nothing outside of the text'): This assertion is made by Derrida in a discussion of the French philosopher, Jean-Jacques Rousseau. In unpacking this, Johnson (1981) states that 'what Rousseau's text tells us is that our very relation to "reality" already functions like a text', and later, 'Rousseau's life does not *become* a text through his writing: it always already *was* one. Nothing, indeed,

[15] As we shall see, this does not imply the abandonment of notions of truth, referentiality or objectivity, a claim that is often made by commentators who aim to demonstrate that deconstruction is a form of postmodern relativism.

[16] This is the dominant epistemological motif of contemporary science, including neuroscience.

can be said to be *not* a text' (p. xiv, emphases in original). The first statement repeats the epistemological claims made above, whilst it is the latter statement that takes on an ontological tone. Here text takes on the status of a fundamental ontological metaphor; life itself is equated with the *archi-écriture*. It is this general textuality that provides the condition for the emergence of speech and writing (in its narrow sense), for experience and subjectivity in general (Culler, 1982; Hepburn, 1999; Royle, 2000). It is within the disruption (not the presence) of *différance* that referentiality, agency (intention), thought and the author must operate. As Hepburn (1999) states, it is *différance* that is the origin of origins, the non-ground for claims of presence.

Given this ubiquitous trace-like structure or textuality there is 'no essential difference between language and the world…' (Bennington, cited in Royle, 2000, p. 7). As will be discussed again in the section on referentiality, there is no strict distinction between the word and the thing, where language lies on one side and the world on the other. Identity and meaning emerge from a referentiality (difference) that exceeds the boundaries of language, and which troubles sharp contrasts between ontology and epistemology. As Staten (1984) writes; 'the permeability to context of its identity makes this identity shade off into its surroundings', and these surroundings are both linguistic and non-linguistic which means that 'language also shades off into what is not-language' (p. 25). In this way the notion of materiality is re-inscribed; neither the materialism of positivism or elementalism, matter here becomes meaningful only through a system of relationality (Cilliers, 1990)[17].

Deconstruction and the 'truth' of the text

As discussed in Chapter 1, deconstruction is parasitic in the sense that it is always a close reading of, a complicit engagement with, a text (Critchley & Mooney, 1994). Given the play of *différance*, texts are never univocal but are heterogeneous entities constituted of various discursive forces (Culler, 1982). Consequently, the writer and interpreter (reader) can never absolutely dominate or control the meaning and logic of the text. Furthermore, no reading of a text may therefore be considered the final word (the truth or *logos*) or

[17] This intimate materialist entwining of meaning and structure is taken up again in Chapter 8.

solution; interpretation is interminable (Wilson, 1998). But this indeterminacy does not imply that the analytic process is pointless, that is, it should not invite a nihilistic attitude. It is the important to not equate Derrida's quasi-transcendental form of logic, the logic of the aporia, to relativism (Hurst, 2004). The affirmation of the play of meaning does not surrender us to an amorphous spillage of meanings since the deconstruction of the oppositions within which we have to operate always results in a re-inscription (Culler, 1982). This re-emphasises that the displacement of meaning is into a new order, not into chaos. The aim of deconstruction is not to replace or eliminate concepts but to redeploy them, to employ them whilst undermining the dominant manner in which they are typically used. But this does not imply that the new deconstructive reading is itself the final word since a reading is always an appropriation and a distortion; an ab/use of the text, itself open to further analysis (Hepburn, 1999)[18]. As will be developed in more detail later, this indicates the political or institutional dimension of interpretation.

A deconstructive reading always proceeds as a double reading; initially a re-articulation of the dominant reading of the text, and then an elucidation of the blind spots of this reading (Critchley & Mooney, 1994). Such blind spots are not simply a remainder, a supplement in the sense of an optional or superfluous extra (Johnson, 1981), that which is in excess of the unity of the dominant interpretation, but something upon which this reading relies, an erasure that is essential for *the* reading's illusion of unity. Nor is the excess an equivalent replacement, a supplement in the sense of a substitution, a united but oppressed other. In this 'logic of the supplement', articulated by Derrida in his analysis of a text by Rousseau, the external (B) does not simply operate as an equivalent of the posited unity (A) (as in A=B), nor is the dominant reading perfectly enclosed (A=A), but what is ruptured is the very notion of unity in that the reading is always supplemented, always reliant on that which lies outside. Within the logic of the frame (the 'paradox of parergonality') that which is marginalised, that which frames an interior, can be shown to be paradoxically central, that which enables the fundamental claims of the interpretation (Culler, 1982;

[18] Derrida (1982) uses the term 'economy' based on the Greek term 'house' (*oikos*) and 'to manage' (*nemein*) to refer to the imposition of an order onto a text, a structure which is always exceeded by the text. He plays on the meaning of *oikos* by using the word *oikēsis* (tomb), which implies the enclosing, death or finality that a reading, an economy, hopes to achieve.

Johnson, 1981). In this way the binary oppositions of essential/supplemental, inside/ outside, and central/marginal are troubled; the dominant terms' claims to presence are disrupted as the dependence on the excluded is demonstrated. Significantly, this then troubles the Aristotelian notion of 'form' as that which is self-identical (A=A) and closed, that is, form as presence (Staten, 1984). Instead its reliance for its identity on its outside means that it is essentially open to its exterior in that this constitutes its distinctiveness. This is what Staten (1984) calls the 'essential law of impurity' as identity is always contaminated by otherness in order to be constituted.

The recognition of the salience of the excluded, as that which enables claims to presence or truth, explains the emphasis in deconstruction on looking for the disruptions, uncertainties, variances, and contradictions that already exist within the text (Hepburn, 1999). This is the search for 'daring proposals' (Culler, 1982, p. 164); the hunt for the 'systematic "other message" behind or through what is being said' (Johnson, 1981, p. xiii). Herein lies the radical potential and the surprising resource of the text. Critchley and Mooney (1994) refer to the problem of closure; the situation in which deconstruction exists, both belonging and not belonging to the philosophical tradition. 'Closure is the double refusal both of remaining within the limits of the tradition and the possibility of transgressing that limit within philosophical language' (p. 449). The process of deconstruction shows how the text depends on the presuppositions of the metaphysics of presence whilst radically questioning what it presupposes, indicating a contradiction that points a way to thinking other than logocentrism. But this closure is a hinge that is aporetic; 'a double and strictly undecidable movement between logocentrism and its other' (p. 449).

This implies that there is no clear transcendence through deconstruction; it cannot abide by fantasies of conceptual genocide and the discovery of a new language. No critique escapes that which it criticises; there is no outside-text, externality or privileged position (Hepburn, 1999; Wilson, 1998). The critical space is never free of complicities from that which it seeks to disinter (Culler, 1982; Wilson, 1998). This is the only language available; these are the tools with which we have to work (Bennington, 2000; Spivak, 1974). This should

humble us but with the modesty of the *bricoleur*[19], who erases the language as it is utilised. If we must use the notions of metaphysics then we must do this by placing these terms under erasure (*sous rature*), continuously demonstrating and reminding ourselves of the illusion and limitations, the necessity and impossibility, of the metaphysics of presence.

The impossibility of complete transcendence implies that the concept of 'truth' does not disappear from the deconstructionist's landscape but that, through a process of displacement, it is reinscribed (Johnson, 1981). Culler (1982) refers to deconstruction as not providing a better notion of truth than used, for example, in correspondence and pragmatic theories but rather as offering 'a practice of reading and writing attuned to the aporias that arise in attempts to tell us the truth' (p. 155). One such aporia is how both correspondence theorists (those that claim truth as 'correspondence between propositions and some absolute state of affairs' (p. 152)) and pragmatists (those that equate truth with that which can be justified according to standards which currently enjoy consensus) utilise the arguments of the other to justify their positions. Pragmatists employ correspondence statements by claiming that truth *is* relative, whilst correspondence theorists, who acknowledge that 'there is a truth but we can never know whether we know it' (p. 153), utilise pragmatic arguments in saying that we still need the notion of truth to give enquiry purpose. Thus each side engages in a performative contradiction; they both use a form of logic to defend their stance that contradicts what they hope to affirm. What emerges is an aporia in the form of a persistent duplicity (treachery) of truth where truth is *both* that which is simply the case whether we believe or validate it or not (the excess), *and* that which can be demonstrated to be the case within a particular framework (the consensus).

Deconstruction is suspicious of the pragmatist's reliance on consensus, their privileging of one side of the aporia, since 'consensuses adduced to serve as foundations are not given but produced – produced by exclusions…' (Culler, 1982, p. 153). These exclusions are of those who do not count as part of the intellectual or scientific community of the time, be they, for example, women, children, the mad, homosexuals or people of colour. In this way the consensus community and its framework exclude those who may offer surprising truths

[19] The handy(wo)man who uses what is available to construct something.

(revelations) about the very system that excludes them. Given its suspicion of claims to unity, deconstruction would emphasise that 'the critical project depends on resisting the notion that truth is only that which can be demonstrated within a given framework' (p. 154); every unity always has a supplement which its attempts to erase at the very moment that it relies on it. This, as we will see, is the political *par excellence*.

The strategies of deconstruction

Both Hook and Parker (2002) and Macleod (2002) typify deconstruction as a process of binary identification, inversion and displacement[20]. Hepburn (1999) argues that critical psychologists have generally failed to recognise and include the third aspect of this process (displacement) and have tended to invert identified binaries without following through on (and then articulating) the radical implications of such an action, that of 'disorganising the entire inherited order and invading the entire field' (Derrida, 2004, p. 39). Instead what occurs is a departure from the process at this point so as to resort to some other frame (an outside-text), such as feminism or psychoanalysis, to provide a ground for critical action.

Several assertions may be identified and countered here: i) Deconstruction provides no ground for political action besides a 'liberal pluralism' (Burman, in Hepburn, 1999, p. 651) – a claim that will be questioned in the next section. ii) In order to found a relevant critical moment we have to go beyond the text under consideration – a gesture that Hepburn (1999) points out fails to fully understand the radical implications of displacement, and holds on to the illusion of some outside-text, some presence that can be utilised as a foundation (Critchley & Mooney, 1994). iii) The characterisation of deconstruction provided by Hook and Parker (2002) and Macleod (2002) tends to fix deconstruction into a method and obscures the host of deconstructive actions, the variety of strategies, that fill out and exceed the 'steps' that (never finally) comprise this 'method'. In this section I turn to this latter point by providing a range of non-comprehensive and brief descriptions of questions and strategies that may be used for deconstructive effect. I loosely follow the typified process, in this way referring to strategies identified in Derrida's work and elsewhere.

[20] We keep in mind here the comments made in the opening moments of this discussion on the aporetic nature of deconstruction as 'method'. A formula is provided here, a dangerous move which is partially disrupted by considering diverse strategies and the commitment to the issue at hand in this project.

Echoing previous comments, Culler (1982) identifies deconstruction as consisting of several moves: i) the identification of the primary binaries within the text, ii) the demonstration of these as having metaphysical, ideological, political and/or institutional consequences, iii) indicating how these hierarchical impositions are undone by the text itself, iv) engaging in the process of working both within and outside of these oppositions (thus exceeding their binary logic), not treating them as errors but as resources for argument, and v) the reinstatement of oppositions now with different status and consequences theoretically and politically.

Critchley and Mooney (1994) emphasise scholarship in the sense of knowing the author's corpus and its wider historical, political and philosophical context, this enabling a reliable rendition of the dominant interpretation of the text. This is a vital point of departure (Culler, 1982), Critchley and Mooney (1994) mentioning Derrida's tendency to quote the text at length in order to ground his claims. Important here is that what is sought is not the identification in the text of some universal set of oppositions but the dominant terms within the *particularity* of this (con)text (Hepburn, 1999). What is characterised *in the text* as natural, normal, obvious and/or universal? What evidence is offered in support of such a claim (Johnson, 1981)? More broadly, what specific meanings are given to a term within the context of the text (Culler, 1982)? How is this meaning instituted, its spillage controlled? That is, what is the economic process here of impoverishment or designification? In terms of logical process; what is the sequence of arguments in the text (Culler, 1982)? How are these grafted (spliced) together to create a sense of unity and/or other effects? Given that the text is then seen as a heterogeneous and inter-textual product, how compatible are these grafts, how do they support and push against each other (Culler, 1982; Johnson, 1981)? Since there is no presence that stands beyond the text, no signifier that is transcendental, no pure representation that escapes the convolutions of the text, extensive attention must be paid to the metaphors (condensation points) and rhetorical movements utilised within the text and the semantic effects these produce (Hepburn, 1999; Norris, 1982).

The implications of these oppositions and sequences may then be further articulated through a variety of routes: What are the consequences of the exclusions of the text (Beardsworth, 1996; Hepburn, 1999)? What violence (institutionalisation) does the text commit? What (institutional) assumptions underlie, and what conditions (terms of engagement) are prescribed, by the claims of the text? With these questions the political (or ideological effects) of the piece may be made more apparent. Beginning to invert this, it is useful to ask whether, as much as there is evidence cited in the text to support a particular naturalisation, there is then not evidence in the same text for the opposite claim. How is that which has been overtly excluded (subordinated) been re-introduced – thus going against (subverting) the metaphysical claims of the text (Culler, 1982)? Turning to commentaries on (or critical debates about) the text, how do these reproduce or mirror conflicts that are already present in the text? Are there moments of meta-commentary, when the text comments on itself, where it tries to step outside itself? What is achieved, demonstrated or countered in such moments?

The subversion and introduction of alternative meanings can also be achieved through a number of strategies: What are the multiple ways that the terms in the text may be translated, this multiplicity going against the text's imposed semantic configuration (Johnson, 1981)? Derrida was well known for exploring connections beyond the semantic, drawing diverse links and playing with phonetic, graphic, morphological and etymological associations (Culler, 1982). Similarly, what effects does contrasting the literal and figurative readings of a term have (Johnson, 1981)? Stepping beyond the privileging of content by attending to the materiality of the text, how can the typographic spacing of the text be used as a commentary on its claims? Asking how the text enacts and not simply states its claims can trouble the depiction of language as transparent. Similarly, asking how the text repeats or mirrors the difficulties of what it is analysing troubles the positioning of commentary as outside of the object of analysis. Surprising and disruptive new meanings can thus be generated, Derrida strategically retaining the text's terms (the 'old names') whilst grafting new significations onto them, this troubling the dominant utilisation (appropriation) of the word (Culler, 1982).

In working with the binary oppositions; how can these be (or, rather, how are these already) inverted? In other words; how can that which has been marginalised be returned to the centre to generate unexpected meanings? Is it possible, working strictly within the logic of the text, to demonstrate that that which has been identified as normal or dominant is rather an instance of that which has been characterised as deviant or secondary? Thus, for example, Austin, has shown that constative (factual) statements, typically considered as superior to performative statements (utterances that execute a rhetorical act), are themselves instances of the latter (Culler, 1982). In Derrida's own analysis of Husserl's theory of signs, he demonstrates how expressive signs (those privileged, transcendental signs apparently filled with the immediacy of meaning) are themselves indicative signs (those that point forever onward) (Critchley & Mooney, 1994; Flynn, 1984). Similarly, literal readings (those 'concrete' translations where signifiers are regarded as unproblematically tied to the reality of our surroundings) may themselves be construed as instances of the figurative (metaphoric) where a particular rhetorical function has been naturalised (Culler, 1982)[21].

Finally, Hepburn (1999) emphasises the identification of 'undecidables' in the text. As previously mentioned, Derrida's analyses are marked by the successive identification of such 'concepts' – for example, gram, trace, supplement, *différance* – what he calls 'focal points of economic condensation' (Derrida, 2004, p. 38). In these 'words' the impossibility of binary logic, the illusion of either/or and neither/nor assertions, of the fantasy of the metaphysics of presence, are demonstrated. In these instances we find the shimmer of a both/and logic, where no clear line can be drawn between the meanings of the term. Undecidables allow for a different 'way of thinking, accounting for and disrupting metaphysical foundations, without putting other foundations in their place', providing 'a

[21] Although such inversions are disruptive they, as we shall see in the (mis)readings chapters, do not simply reduce the other to a secondary role – which would be a conservative operation – but should make apparent the mutual contamination between these concepts. For example, the mutual contamination of performative/constative statements: As indicated every constative (factual) statement is a performance, an act, a doing of something, an effect (even if only by 'stating' something). But, equally, every performative statement is constative for, in order to be able to do or act it must be intelligible, it must conform to some code, rule, or convention (Royle, 2000).

way of undermining [particular] claims to truth without ourselves having to argue from some fixed position' (Hepburn, 1999, p. 649).

The politics of deconstruction

Beardsworth (1996) refers to 'politics' as 'the domain or practice of human behaviour which normativizes the relations between a subject and its others (other human subjects, nature, technics, or the divine)' (p. 158). In other words, it designates those practices through which a particular way of relating to a specific other is cast as natural, normal, apolitical, ahistoric and/or unproblematic. Here we may then consider, for example, the relationship between the subject and its body, and a discipline and its object of investigation, including the diverse norms, characterisations, and exclusions involved in such relations. What is important here in terms of the text is the use of rhetoric and the ideological effects thereof. Since it involves a naturalisation, this implies that such practices include the erasure of the 'normativising' practice in itself, of the violence committed by the decision involved in such an institutionalisation. There is thus a simultaneous and double violence involved here; that of the institution of a relation as normal and, in this very act of normalising, the erasure of the decision; the political aspect of such a practice.

Distinguishing the 'political' from 'politics', Beardsworth (1996) refers to this as 'the instance that gathers or founds such practice *as* a practice', or as 'the trait that allows us to describe/recognise a gesture of thought or action as political' (p. 158). That is, it is the recognition that this status as natural *is* the result of a practice, an institutionalisation, a political act. Here then the erasures described above are made visible as the practices through which a relation has been cast as universal, normal or natural are revealed. Of course, the practice of determining (or indicating) what is and what is not political is itself a political act. But it also acknowledges the need to identify the founding *acts* which are passed off as natural; the *originary violence* which always returns in the form of contradiction resulting in further acts of violence aimed at keeping the system coherent.

Beardsworth (1996) argues that deconstruction is inherently political, and yet Derrida's work has been passed off as apolitical (Hepburn, 1999), relativist (Olivier, 2007), liberal (Eagleton, 1981), anti-democratic (Beardsworth, 1996), and a form of liberal pluralism (Burman, cited in Hepburn, 1999). Culler (1982) points out that deconstruction is instead a way of taking a position in relation to political and institutional structures, a process of contesting the particular institutionalisations (that is, those acts that have acquired some form or endurance) of theory. In a similar vein, Wilson (1998) refers to identifying the establishment of dogma within academic fields, the ritualised exclusion of certain notions and ideas[22]. Once these are marked as illegitimate or taboo such exclusions are unreflexively repeated (institutionalised) across the texts of the institution.

'[D]econstruction is never concerned only with signified content but especially with the conditions and assumptions of discourse, with frameworks of enquiry, it engages with the institutional structures governing our practices, competencies, performances' (Culler, 1982, p. 156). Politics is intimately involved with discursive structures and 'systems of signification' (Culler, 1982, p. 157). Thus the inversions and displacements of this 'method' have 'potentially radical institutional implications' (p. 159) - that are, admittedly, often 'slow to work themselves out' (p. 157). The consequences of deconstruction extend far beyond the text to speak back ethically to the institutional and political context in which the text emerges as salient. Clearly then deconstruction is not hygienically separable from politico-institutional issues. The attempt to utilise it in either an apolitical fashion or as a stepping stone to ground another political agenda implies a misreading and erasure (a political act as such) of its political commitment (Hepburn, 1999).

Deconstruction involves a rehabilitated enquiry of accountability (Culler, 1982). Through it we can investigate the practices through which we represent, manage and convey the world and, in displacing the logic of such practices, we can generate unanticipated resources and bold novel proposals. It is not the neutralisation of binary structures, an act which Derrida points out simply leaves things as they are, but the search to reveal 'the contamination of arbitrariness by motivation' (Beardsworth, 1996, p. 190) and the

[22] The process of such, often dogmatic, exclusions in embodiment work is described in the previous chapter.

possibilities of de-motivation and re-motivation. The political is made apparent in deconstruction; the fixing, or institutionalisation, of meaning links, is an essential aspect of signification as much as its play and interminability. These are unavoidably political since they are marked by methods of exclusion, violence and naturalisation. Political contamination is unavoidable and thus regular and 'normal', the political nature of discursive instantiations indicating the limits of objectivity.

Derrida articulates a tertiary structure of violence underlying the processes of institutionalisation and deconstruction: i) Arché-violence refers to the aneconomic play of *différance*, the process that gives lie to claims of presence. It is that which enables and at the same moment threatens that which emerges from its play. ii) Secondary violence (the law) is that which attempts to erase arché-violence, that is, it refers to the institutionalisation of presence. iii) Tertiary violence, the deconstructive process, reveals such erasures and its transgressions within the same text and the inability of the law to suppress the originary *différance* (Beardsworth, 1996). The above reveals that 'the radical "method" of deconstruction is at the same time the formalisation of the forming [instituting] and unforming [break down] of *law'* (Beardsworth, 1996, p. 24), as both secondary and tertiary violence are reiterated over the play of arché-violence.

All fixing of meaning presupposes the 'originary violence of the radical impossibility of a proper name' (Beardsworth, 1996, p. 24). Given this, the law needs to be constantly instituted (repeated). These three forms of violence arise together and are thus inseparable and interminable. The 'law of law' may then be read as the essential inability of the law to be a law (ahistoric and universal). The economy of law can 'be taken into account in such a way that one's judgements are made in recognition of the law of contamination [which is also the condition of invention] which at the same time exceeds them' (p. 25). Deconstruction cannot be equated with or reduced to any one aspect of this trinity of violences.

THE LIMITS OF ARTICULATION

Having provided a reading of deconstruction as 'method', I now turn in the penultimate section of this chapter to a particular critique of deconstruction. This proposes that deconstruction constitutes a closed system (*langue*) which in no way can then extend beyond itself. I challenge this reading through several considerations: Derrida's articulation of context, Nightingale and Cromby's (2002) notion of referentiality and its link to Derrida, and finally, the deconstructive reading of the theory/empirical binary. The dismantling of this critique then allows me to close this chapter by returning to the notion of 'conceptual investigation' (Machado et al., 2000) introduced at the start of this chapter, now comparing this with deconstruction. This then finally illustrates how this 'method' can be utilised in an apparently ironic return to language (within the context of this project) to analyse several texts within the neurosciences.

Referentiality

In a confrontation with deconstruction, van der Merwe and Voestermans (1995) ask to what extent we are caught in the 'confines of the linguisticality,… the "textuality", of our experience of the world which allows us no direct access to the world, but commits us to a never-ending, groundless, undecidable and therefore playful interpretation of the 'realities' we construct and 'deconstruct' by means of our discourse' (p. 29)? Arguing against this characterisation, they state that language can still refer and reflect experiences of reality outside and independent of language, that is, we are not caught 'within the confines of a closed, self-referential system of language in which signs only refer to signs and thereby endlessly defer access to the world' (p. 36). In other words, the theory of deconstruction is problematic in that language is defined as a closed system comprised of signs that can only refer to each other and, therefore, the possibility of referentiality is basically impossible; there is 'no direct access to the world' and contact to the world is continually deferred. Here I wish to challenge this reading of deconstruction and the claims that are made on the basis of such a characterisation.

As just mentioned, van der Merwe and Voestermans (1995) refer to a 'textuality' that 'commits us to a never-ending, groundless, undecidable and therefore playful interpretation' (p. 29). It is exactly this reading of deconstruction that Hurst (2004) examines in the work of the philosopher Richard Rorty. She criticises him for providing a reading of Derrida which reinserts a binary and then attempts to locate the complexity of quasi-transcendental logic on one side of such an opposition. Rorty contrasts 'philosophy' with 'literature' regarding the former as the traditional project of seeking foundations for the establishment of the knowledge project whilst the latter is aligned with 'textuality', similar to that referred to by van der Merwe and Voestermans, that is, a radically anti-foundational programme where meaning is forever cast into play. The similarity between this and the previously discussed reading of deconstruction as relativist should be apparent.

What is not noted in this characterisation, according to Hurst (2004), is: i) the ironic re-insertion of a binary structure despite an explicit commitment by Rorty to the free play of textuality, and ii) the complexity of the logic of the aporia that is repeatedly articulated across Derrida's work. This logic cannot be reduced to one side of a foundationalist/anti-foundationalist binary since Derrida (2004) is absolutely clear that the logocentric inheritance cannot be escaped; that we work both within and in excess of binary logic. Rather than slip back into an 'either/or' choice so as to justify an 'anything goes' attitude, deconstruction accepts that foundations are always re-established (reinscribed) and that we are thus caught in a 'both/and' condition, never beyond but always in excess of claims to presence. This impossibility of resolution, the interminability of process, the continuous play of violences, the failure of establishing permanent foundations, and the acknowledgement of a radical finitude, does however not allow a posture of frustration or paralysed inactivity; rather one must still act (responsibly) but now without naiveté or arrogance (Beardsworth, 1996; Hurst, 2004).

Norris (2004) notes Derrida's growing annoyance with interpretations of his work that 'take him to reject the very notion of reference, or to argue that there is no "extra-linguistic" reality by which our various statements, hypotheses, predictions, etc. might ultimately be assessed in point of their truth or falsehood' (p. xxxv). As already discussed,

deconstruction does not abandon the notions of truth and falsity 'but "reinscribes" them – together with the referential function of language – in a more complex differential "economy"' (p. xix). Derrida does not reduce philosophy or science to rhetoric or literature; his is not 'a *discourse against truth* or against science[23]' (p. xxv, emphases in original). Instead, he 'respects the most exigent standards of logical and evidential argument even though it raises significant problems with regard to the issue of truth, knowledge and representation' (p. xxvii). We must continue the traditional work of both science and philosophy but with humility, acknowledging the convolutions of the text. Deconstruction does not imply textual navel-gazing, a discursive preoccupation that obliterates the other; the function of referentiality and the realm 'beyond' language remain. Given what has been 'said' in this chapter what else would we expect deconstructive logic to do with any claim that inserts a binary of *langue*/world?

In his deconstruction of his work, Derrida agrees with Austin that meaning varies with context (Culler, 1982; Derrida, 1986). He identifies the radical moment in Austin's work as the subjugation (not the elimination) of intention[24] (the dominance of consciousness) in favour of the emergence of meaning as the result of conventional rules based on features of the context. However, when faced with the impossibility of exhaustively specifying the contextual determinants of meaning, Austin compromises this radical aspect and reintroduces the notion of intention as the final factor to enable such determination. In his reading Derrida reasserts the radical moment by indicating that the 'total context is unmasterable, both in principle and in practice. *Meaning is context bound, but context is boundless*… no meaning can be determined out of context, but no context permits saturation' (Culler, 1982, p. 123, emphases added).

For me, the important point in the above discussion is that Derrida makes *reference to context*! There is thus in his analysis an acknowledgement of the possibility of referring to a point outside of the play of *langue* (that is, language retains a referential function) and,

[23] This point will be touched on again in the closing section

[24] The notion of 'intention' is only briefly touched on here. This and the concept of 'iterability', central to Derrida's (1986) reading of Austin's schema, will reappear during the (mis)readings that comprise the next three chapters.

more than this, that the realm beyond language has consequences for the establishment of meaning (it is open to outside influence). Furthermore, like language, which is *one* system of signification, *one* field for the play of *différance*[25], context is described as an open system, beyond saturation and termination. Thus any claims to deconstruction relying on a 'closed, self-referential system of language' or systems in general fails to consider the implications of Derrida's inclusion of context in the determination of meaning[26].

In Hurst's (2004) discussion of Derrida's quasi-transcendental logic, she notes that 'present terms are not given as such, but occur as the *effect* of the *interaction* between *what is given* and *cognitive faculties*, both of which, insofar as their ultimate nature is concerned, withdraw from apprehension in this very interaction' (p. 249, emphases added). Also, 'both exceed the domain of apprehended reality (or phenomenal reality) and 'remain unspeakable within it' but are not then simply absent from this domain (p. 249). In other words, for Derrida, 'any expression that refers to an object' (p. 249) is not simply provided from outside of social interaction by the object itself, or simply attributed by humans outside of the physicality of the object as such, but occur as the result of the *interface* between the properties of the object and 'the being to whom the given is given' (p. 249). Both object and being surpass reality as understood and as experienced and exhaustively describing their ultimate nature is impossible but, importantly, they do still feature.

The above bears a resemblance to an argument by Nightingale and Cromby (2002):

> If objects exist independently of language, then unless materiality were wholly uniform (in which case the markings we call text would be imperceptible), they must have differential properties. And if objects have differential properties, it is untenable that the language we use to socially construct our world and activity does not – on occasion, and however imperfectly, partially, tangentially or implicitly – reference these differences (p. 703).

[25] One may consider here Derrida's deconstruction of Husserl's phenomenology of time, where this non-linguistic system is identified as one of signification (Critchley & Mooney, 1994).

[26] As Royle (2000) points out it is a widespread misunderstanding that deconstruction (and 'text') is limited to language, rather deconstruction 'has to do with identity and experience in general' (p. 7).

Thus for both Derrida and Nightingale and Cromby it is necessary to admit 'a troubled relationship between language and materiality' (Nightingale & Cromby, 2002, p. 711). The concept of referentiality is thus not limited to the system of signs in the work of deconstruction as van der Merwe and Voestermans (1995) would have us believe; rather the relationship between *langue* and the world is troubled but in no way closed. If anything, *langue* is of and possible due to the (materiality of the) world. It is *because* of this that deconstruction can act as a radical intervention, since by inverting and displacing the conceptual order one also then does this to the 'non-conceptual order with which the conceptual order is articulated' (Derrida, 1986, p. 329).

Next I will unpack this relationship in a different manner by referring to the deconstructive analyses of the theoretical/empirical (transcendental/empirical) binary. Since this particular project is one that attempts to contribute to the theorisation of the (biological) body, it is essential to clearly articulate the nature of the relationship between these aspects. Here I then turn specifically to discussions by Beardsworth (1996) and Wilson (1998).

The empirico-transcendental difference

Beardsworth (1996) identifies in the sign as described by Saussure the seminal instance of the empirico-transcendental difference. The signifier is aligned with the worldly and the material, whilst the signified with the other-worldly and ideal. This distinction can be traced across numerous other binaries such as the finite/infinite, body/soul[27], nature/law and the particular/universal. In the conceptualisation of the abstract (transcendental) system of *langue* we have a separation from the 'empirical multiplicity of languages and their linguistic, physical and physiological variations' (Beardsworth, 1996, p. 8), this relying on a distinction between the internal and essential and the external and accidental. Thus a clear dissimilarity is drawn between the empirical and the transcendental in Saussure's schema which then resonates with numerous other binary oppositions.

[27] See Chapter 2 for a historical exposition of this distinction.

Derrida's reading disturbs the clarity of this distinction without dismissing the 'inescapability of re-inscribing the empirico-transcendental' distinction (Beardsworth, 1996, p. 10), that is, without denying that we have to operate within the conjunction of the impossible and the necessary (Wilson, 1998). Once again the point is made that there is no escape from metaphysics but there is also no question of accommodating its exclusions and violences, thus implying a ceaseless negotiation with both metaphysics' constitutive and constraining effects.

In his displacement of the claims of Saussure and Husserl in the articulation of the *archi-écriture*, Derrida posits a notion of quasi-transcendental status, that is, that which is neither (both) transcendental nor (and) empirical, an undecidable (Beardsworth, 1996). The circularity implied in the relationship between Saussure's *langue* and *parole* has already been described, where the former relies on the (empirical) event of the utterance, whilst the latter depends for its meaning on the (transcendental) structure. Thus an irresolvable alternation, an endless shifting back and forth, is implied where neither enjoys primacy or superiority (Culler, 1982).

In Husserl:

> Writing constitutes ideal objects by delivering them from the ties of spatio-temporal facticity. The condition of their ideality is their repetition through time and space; this repetition depends on their inscription on a support that transcends the empirical context. The very support that allows for transcendence from the material world is itself material, necessarily restricting the purity of the transcendence for the material that is aimed at. Conversely, such repetition is not possible unless the difference of each inscription re-marks the inscription, just as the concrete 't' is re-marked in order to be recognised as such by its 'acoustic image' (Beardsworth, 1996, p. 16).

That is, ideal objects are constituted through a process of abstraction from the flow of the empirical. The possibility of this depends on the phenomena's continuous re-inscription

(that is, reoccurrence in time and space). There can hence be no identity without empirical repetition; but the recognition of something as repeated, as having identity, requires the transcendental (Staten, 1984). But repetition simultaneously puts in question the identity (abstraction) it brings about, since repetition is always made in difference. There is no absolute repetition, no repetition without variation. Yet the 'difference' of each inscription, in order to be recognised *as* a repetition, must evoke the transcendental, the ideality. Thus what is implied is a 'middle ground', neither 'suspended in the transcendental nor rooted in the empirical, neither in philosophy nor in any empirical negotiation of the world that refuses to pass through the transcendental' (Beardsworth, 1996, p. 17). Neither notion of the empirical or the transcendental is complete within itself; each requires supplementation by (the contamination of) the other to come into meaningful existence.

The implication of the above is that empirical practice, the work of careful description and rigorous 'looking', is always theoretically inflected (Wilson, 1998), just as the theoretical is always actualised through empirical instantiation. As much as Machado et al. (2000) decry the absence of conceptual work in mainstream psychology, Rubin (cited in Wilson, 1998), condemns the lower status (or even absence) of the empirical in critical work (this resulting in a 'galloping idealism' (p. 83)). As warranted as these comments are, in both cases we however encounter the retention of a strict demarcation between data and literature, between actuality and representation, between empiricism and theory (Wilson, 1998). What is overlooked in such critiques is the demonstration above of the folding of the one into the other where, as Derrida points out, the relationship between empirical data and interpretation (abstraction) cannot be conceptualised in terms of an equivocal opposition or choice. Given their co-substantiation, the task is to '*neither* take certain empirical data to be the final word on the viability of particular theoretical procedures *nor* consider empirical data as secondary and supplemental to the primacy of the philosophical, literary, or visual theories' (Wilson, 1998, p. 86, emphases added). One has to then proceed by means of a double movement; acknowledging and showing deference whilst simultaneously rigorously scrutinising both. Neither can act as a foundation.

I am now finally able to bring this chapter to a close. I do this by returning to a discussion of conceptual investigation and critical method, topics touched on in the first section of this chapter. I then return to the notion of grammatology so as to describe the relationship between it and science, this providing the final justification for the utilisation of deconstruction in this project. Finally, the selection criteria for the texts (mis)read in this project are identified.

THE RETURN TO LANGUAGE

Prior to developing the call by Machado et al. (2000) for conceptual investigation by unpacking various dangers of words, Lourenço (2001) reiterates that 'we need to command a clear view of our use of concepts' (p. 90). He warns against importing concepts from other contexts without sufficient justification. Such inclusions (and exclusions), as well as their concomitant silences and stylistic changes, should be investigated. The 'method' of deconstruction would similarly require such a sensitivity and logical rigour (Norris, 2004), asking in what sense the term is being used in this context; what rhetorical function it fulfils as it is utilised. It would however not share Lourenço's exclusionist suspicion of the importation of word's from other 'contexts', since contexts are always open, the grafting of terms into new contexts is a general occurrence and marks the play of *différance*, and it is rather the *exclusion* of certain concepts that is to be treated with suspicion.

Lourenço (2001) warns against reductionism, the reification of concepts, and the use of ad hoc explanations to cover over tensions in the text. A guiding light here would be the identification of empirically testable hypotheses. Derrida's (2004) own challenge to the reductionist (exclusionary) politics of metaphysics and simple correspondence notions of language is echoed here as is his interest in the flow of rhetoric as the contradictions inherent in the text strain its overt metaphysical logic. However, the reliance on empiricism as some sort of foundation would be challenged with the articulation of the mutual reliance inherent in the empirical/conceptual binary, a dependence that displaces any naïve notions of empirical facticity. This does not imply some commitment to obscurity in deconstruction (Norris, 2004), rather it seeks the *elucidation* of the closing down (or the

control) of complexity, the play of meaning, through procedures of exclusion and the positing of presences and foundations. There is thus no injunction against clarity, the use of argument and evidence, or lucid explanation. On the contrary what is required is a careful unpacking of the text, one whose displacement should not come at the cost of a solution, the claim to some new atemporal foundation (Wilson, 1998).

Given what has been articulated in this chapter, it is not controversial to state that Derrida would agree wholeheartedly with Lourenço's (2001) closing remark that the imprecision of language is not a shortcoming but essential for its purposes and that conceptual investigation does not indicate a positivist obsession with univocality. This would in fact seem to be a restatement of a fundamental observation of the nature of language by Derrida. What might be questioned is the characterisation of certain instances, certain uses of terms, as 'errors', this calling for the deconstructive process of elucidating how the claims of the text rely on the very terms being excluded. Such an identification of 'errors' is itself then a process of secondary violence, the institutionalisation of a rationality that excludes, one that calls for the tertiary violence of deconstruction. Here, no claim can be entertained that terms are simply representative, instances of the concrete, factual and literal; instead their status as a special case of the figurative would be demonstrated.

Deconstruction resembles the critical method articulated by Osbeck (2005) and Yanchar et al. (2005) in that it emphasises the importance of the particularity of the context under consideration and the consequent creativity required in the generation of methodological procedures. It too ultimately seeks new configurations that allow for innovative directions in thought and activity. Furthermore, it also calls for attention to be paid to the explicit exclusions called for by dominant methods. In contrast to the methodological stasis sought by such projects of universal ambition, its 'method' is always cast in motion; strategies, arguments, and justifications should be subservient to the consideration at hand. Here the particularity of the text under contemplation is important since deconstruction is a 'faithful intervention' (Wilson, 1998, p. 29) working within the unique (specific) convolutions of the text. With its inherent political orientation and concern with institutional influences, deconstruction echoes Osbeck's (2005) emphasis on the ethical value of research. As with

Yanchar et al. (2005), there would thus be no allowing for a privileged ground that is beyond critical examination, rather no solution is final, no space is finally established, as readings are continuously opened to usurpation.

As previously indicated, grammatology is proposed by Derrida as a *science* of writing-in-general. Wilson (1998) asks in what sense grammatology is then a science? If considered as a practice which deconstructs the metaphysics of presence, it could be understood as an assault on a science that wishes to propose universal and atemporal axioms. Here it would then seem to be 'less a science than its interrogator' (Wilson, 1998, p. 86). And yet it also takes from and is occupied with 'traditional scientific semiological work'; it is complicit and works within such a field, ultimately positioning itself 'between and across the division of science and interpretation' (p. 86). As always deconstruction engages in the double movement of employing whilst undermining its host. In relation to science Derrida (2004) puts this succinctly:

> [Grammatology must] accentuate whatever in the effective work of science contributes to freeing it of the metaphysical bonds that have borne on its definition and its movement since its beginnings. Grammatology must pursue and consolidate whatever, in scientific practice, has always already begun to exceed the logocentric closure (p. 30).

For Wilson (1998) grammatology is the rigorous examination of the irresolvable movement and partition between science and interpretation, between empiricism and theory, so as to 'address the logic that enforces the political and epistemological abyss between data and interpretation', to 'refigure the traditional difference between a scientific project and an interpretive one', as 'an epistemological and political intervention that neither science nor philosophy, traditionally conceived, could realise' (p. 87). It is a relationship that effectively places 'science under erasure, a science at odds with the binarism that seeks to control it' (p. 88). As such grammatology then provides the route by which to challenge attempts to separate science and criticism, moves that divide the (biological) body from the

political. Deconstruction allows us to challenge such divisive institutionalisations, which ultimately only limit the effectiveness of both critical psychology and neuroscience.

We find then in deconstruction the tools and notions to sculpt a 'method' for this project: It is a 'method' which works from within, intimately engaged and complicit with its object of analysis, both inside and outside the convolutions of the text, negotiating within the double bind of the necessary and impossible. It is critical and inherently political, it however does not buy into fantasies of purity and thus does not seek to destroy but displaces, treating texts as resources and openings for critical theorising. It challenges discursive reductionism by providing a sophisticated understanding, via the logic of the aporia, of the empirical/theoretical binary, of referentiality (signification), of materiality, and the relationship between itself and science. Here then, in an apparently ironic moment, I, in only seeming contradiction of the arguments articulated in Chapter 3, return in my methodology to textual analyses (a turn to language) in order to address the objectives specified at the close of Chapter 1.

Part 3 provides deconstructive (mis)readings of three neuroscience texts. In this manner this project distinguishes itself from similar studies by means of a generic move of sorts; 'generic' in that it casts its net wide by not focussing on only certain themes in neuroscience and a 'of sorts' in that its focus becomes particular by concentrating on a limited number of texts. Thus a diverse set of issues that preoccupy contemporary neuroscience are touched on but through the lens of the 'products' of specific 'proper names'. Given this limitation, these texts have to be chosen carefully and according to specific criteria. Hence, these 'products' are texts that enjoy distinction in the field; they are exemplars of what is considered to be excellent research. Furthermore, they are written by prominent neuroscientists, individuals that enjoy seniority and are well acknowledged experts within the discipline. The emphasis is thus on the mainstream and not on fringe or controversial work. These (mis)readings aim to work within the conservative heartland of neuroscience. However, as indicated above, within this restriction a large degree of diversity is sought: As will become clear the texts focus on a diversity of issues (although, as will also become apparent, these show a remarkable degree of thematic overlap); thus

there are detailed considerations of specific functions (e.g., emotion and reason), macro-structures (e.g., frontal lobes and the amygdala), and micro-structures (e.g., synapses and neurochemistry). The authors also vary in background; diverse both in terms of profession (i.e., a neurologist, a neuropsychologist, and a neuroscientist), educational history (i.e., Portugal, the USSR and the US), and research interests. It should be noted that with this quite traditional justification for the inclusion of a set of distinct texts by credible representatives of the field, I am engaging in what Spivak (1974, p. liv) refers to as the establishment of a 'convenient fiction'. By referring to the proper names of these authors, as well as their predecessors and peers, I establish a 'sovereign self against the anonymity of textuality', a 'proper name that pretends that it is the origin and end of a certain collocation of thoughts that may be unified' (p. liv). The convenience of such a pretence is that it provides a useful and practical 'substitution' (metonym) through and around which to engage with an area of interest, to explore the possibility for new understanding, to enter an ever open field of meaning. Finally, since the focus is on contemporary neuroscience, fairly recent publications were chosen (i.e., 1994, 2001, and 2004). Although the first text is now more than 15 years old its continued prominence in contemporary thought is established in the next chapter. Generally, each (mis)reading chapter will initially provide a justificatory account for the inclusion of each text.

PART 3
(MIS)READINGS

CHAPTER 5
DAMASIO'S CORPOREALITY

INTRODUCTION

This chapter provides an account of a deconstructive reading of *Descartes' error: Emotion, reason and the human brain*, a text published by the neurologist Antonio Damasio in 1994. The chapter is divided into several sections: The first is a set of justifications as to why, given that Part 3 only consists of three chapters, one of these should focus on Damasio's work and *Descartes' error* specifically. The second section briefly describes the book's structure and its fundamental points. This is followed by the articulation of the radical moments identifiable in the text, where binary structures dominant within the field of mainstream neuroscience are troubled. A radical structure, characterised by reiteration, multiplicity and juxtaposition, identifiable in the text is then described. This is a dynamic organisation which, if taken seriously, undermines the possibility of drawing distinctions between the brain, mind, body and environment. In the section which follows I argue that the homunculus, an emblem of Cartesian metaphysics explicitly ostracised by Damasio, returns implicitly through the use of a metaphysical discourse, typified by notions such as representation, map and image, amongst others. Within this context a reading of the central notion of intimacy as an impossible necessity for understanding the body-subject is unpacked. The penultimate section then considers several distinctions made in the text which trouble attempts to draw clear lines between the past and present and structure and activity, as well as efforts to instantiate pure and pre-social notions of feeling, behaviour and sensation. The chapter closes with a synopsis.

DAMASIO AND *DESCARTES' ERROR*?

Given the enormous dimensions of the field of neuroscience, whether in the form of, for example, neurology, biological psychiatry, neuropsychology, or neuropharmacology, what then justifies the focus on a text by the neurologist Antonio Damasio (especially given that there is only scope within this project for the deconstructive reading of three texts)? A prolific and well-respected writer and researcher within the field of neurology, it is hard to

find a well-regarded general text in neuroscience that does not refer to studies published by Damasio (e.g., Kandel, Schwartz, & Jessell, 2000; Kolb & Whishaw, 1996; Lezak, Howieson, & Loring, 2004). He has received numerous scientific honours, including the American Medical Association's Beaumont prize which he shared with his wife Hanna Damasio (Damasio, 1994). Beyond this, Damasio has produced texts and ideas that have crossed beyond his discipline to find audiences both in other fields (such as critical psychology, cultural studies, and philosophy) and amongst so-called 'lay' reading populations. Cromby (2007) notes Damasio's influence in the fields of 'economics, politics, personality theory, psychopathology, ethics and art' (p. 156). He refers to Damasio as having achieved a celebrity like status across the 'decade of the brain' of the 1990s, enjoying wide attention, being relatively accessible to diverse audiences, and being an influential popular scientist (Cromby, 2006).

As just mentioned, Damasio's ideas have been taken seriously (in the sense of being utilised) in several fields outside of neurology. Thus, for example, the critical psychologist John Cromby has utilised Damasio's ideas in developing an 'adequate notion of embodied subjectivity' (Cromby, 2004, p. 797), also using Damasio's work in seeking to develop a bridge between the endeavours of social science and neuroscience (Cromby, 2007). William Connolly (2002, p. 2) has used Damasio's notions in articulating 'body-brain-culture relations', attempting to conceive of a form of thinking beyond cognition, one that does not ignore affect or the somatic in the articulation of what he calls 'corporeo-cultural life' (p. 18). Slavoj Žižek (2006, p. 227) has engaged with Damasio's concepts, disagreeing with him in an attempt to illustrate his own Lacanian based conception of the 'empty core of subjectivity'. Closer to neuroscience, Bennett and Hacker (2003) make numerous references to Damasio's work in their critical analysis of common conceptual problems within the field. Thus, although mostly published in the 1990s, Damasio's work continues to enjoy significant academic attention and influence. Given these justifications (i.e., Damasio's reputation and the claimed utility of his work both within and outside of his own discipline), it makes strategic sense to engage with his work, since to do so is to then enter into an already existing larger dialogue with a range of writers and disciplines that well exceed the confines of neurology.

Damasio has since the mid-1990s produced three influential books in the field of neuroscience. The first of these, *Descartes' error: Emotion, reason, and the human brain*, appeared in 1994, and explored the role of emotion and feeling in reasoning and decision making. The most widely known of the three books, it is notable for its attempt at dismantling the reason and emotion (and thus indirectly the mind and body) distinction that has kept the study of cognition 'un-affected' for most of the twentieth century. The 1999 publication, *The feeling of what happens: Body, emotion and the making of consciousness*, deals with consciousness utilising the foundation established in the first book, whilst 2003's *Looking for Spinoza: Joy, sorrow and the feeling brain*, Damasio's celebration of the work of Spinoza, attends to feelings, specifically 'what they are and what they provide' (Damasio, 2003, p. 6)[1]. It is only really the first two books that are referred to in the texts mentioned above, the exception being the 2007 article by Cromby where he provides a brief synopsis of the third book. Since *The feeling of what happens* is a development of the ideas provided in *Descartes' error*, it was decided to dedicate the analysis to the latter text, treating it as a contained unit whose deconstruction then provides an indirect commentary on Damasio's later work. It was also found that a deconstructive reading of this text provided sufficient and thoroughly rich material, whilst moving beyond this would push against the physical constraints of this project and detract from the purpose of focusing on a diversity of texts in supporting the claim that neuroscience provides a set of resources that helps address the biological silences of critical psychology.

DESCARTES' ERROR: FUNDAMENTAL POINTS AND TEXT STRUCTURE

In the introduction to *Descartes' error*, Damasio (1994) identifies three themes in the book. First, 'emotions and feelings may not be intruders in the bastion of reason at all: they may be enmeshed in its networks, for worse *and* for better' (p. xii, emphasis in original). Here his challenge is to the classic Enlightenment distinction that has been drawn between reason and the passions, where the latter are considered as contaminants of rationality.

[1] For all the chapters in the '(Mis)readings' part, any page numbers with no indication of author or date indicates that the reference is to the text under analysis, in this case *Descartes' error* (1994). As is to be expected, extensive use will be made of quotes from each text so as to ground various claims.

Reason, depicted as a 'bastion', is a fortress against the invasion of feeling and emotion, those barbaric forces that threaten the exercise of pure reason, that which promises to lead us into the light of truth. This is then Damasio's primary challenge; he seeks to trouble this binary distinction, a dominant division in western thought for which he identifies Descartes as a spokesperson[2]. He aims to undo this conceptualisation on the basis of clinical and anatomical evidence: Not only are reason and the passions then shown to be entwined ('enmeshed'), they are so for better and worse, that is, they are *both* essential for the effective engagement of the human organism with its environment *and* very often the source of things going awry. If there is enlightenment for us then the failure to achieve it should no longer result in the scapegoating of emotion and feeling; this solution can no longer hold in the face of empirical evidence.

What should also be noted in the above quote is that Damasio refers to 'emotions *and* feelings' (p. xii, emphasis added) and he therefore does not follow the common practice of using these terms as synonyms. Instead he defines emotion as 'a collection of changes occurring in both brain and body, usually prompted by particular mental content' whilst feeling is 'the perception of those changes' (p. 270). We may immediately note the distinctions that are drawn between brain and body, corporeality ('brain and body') and the mental, and corporeality and perception. These are important distinctions which will be addressed later but for now the above division allows us to understand this conceptualisation of feeling which Damasio identifies as 'the second and central topic of this book', where 'the essence of feeling may not be an elusive mental quality attached to an object, but rather the direct perception of a specific landscape: that of the body' (p. xiv). The description of the body as a 'landscape' is a common metaphor which Damasio draws on in his book, where feeling becomes a perception (akin to a tourist admiring a vista) aligned with the other senses such as vision and hearing. In relocating feeling within the category of perception, Damasio hopes to challenge the common take on (and consequent avoidance in the neurosciences of) feelings as being ephemeral. This relocation, however,

[2] Although, Descartes is not one that gives himself to an untroubled reading since Damasio does not provide a simple understanding of Descartes' dualist position. He wonders, for example, about the political utility of such a binary conceptualisation for a man in the Descartes' social position, evoking questions as to his possible 'real' opinion.

brings its own set of problems, one that points us straight back to metaphysics. It is a solution that I will argue later indicates an interesting tension within the text.

It is important to note that the body (the third theme of Damasio's text) is identified as an important player in this field. Two points may be made at this early stage: First is Damasio's alignment of emotion with the body. He therefore echoes the previously discussed[3] tendency, traceable back to the Ancient Greeks, of aligning the passions with the corporeal. This then raises the question as to how he then achieves an avoidance of a reinscription of the traditional mind/body divide, a question more fully addressed in the next section. Second, Damasio's insistence on including the body provides a challenge to the common practice in the neurosciences where a focus on the brain eradicates the need to heed the body in any significant manner. Wilson (1998) has equated this practice with the reintroduction of Cartesian dualism, where the brain now takes on the role of a material substitute for the mind, really a form of neural reductionism or neuro-centrism, which retains the body as an elsewhere and so essentially keeps the mind/body distinction intact.

The body as his book's third theme is one that Damasio almost immediately seems to erase as we see in the following passage:

> the body, *as represented in the brain*, may constitute the indispensable frame of reference for the neural processes that we experience as the mind; that our very organism rather than some absolute reality is used as the ground reference[4] for the constructions we make of the world around us and for the construction of the ever present sense of subjectivity that is part and parcel of our experiences... (p. xvi, emphases added)

What is notable in the above is that it is not the body that Damasio identifies as the ground reference but its *representation*. It is this re-presentation of the body that provides the reference point for constructions of the world, subjectivity and consciousness. The

[3] See Chapter 2.

[4] This bears resemblance to Lakoff and Johnson's (1999) reading of the embodied mind.

utilisation of notions such as 'representation' are however problematic since, as we will see, they lead us right back to both metaphysical concerns with foundations and the homunculus that Damasio is at pains to evict. Yet, there is also a process of deferral at work here which offers a radical route for reading the body. For now, given these central themes identified by Damasio, I will here provide a synopsis of the structure and content of the text. The aim here is to orientate the reader prior to providing a critical reading of the contents and arguments that comprise the book.

Aside from an introduction and substantial postscript, *Descartes' error* consists of three parts: Part one, made up of four chapters, is where Damasio, drawing on various case studies, argues for a link between the prefrontal cortices of the brain and the functions of reasoning[5] and decision making. In the first chapter, he adopts a floral literary style[6] in narrating the story of Phineas Gage, the railway construction foreman, who in 1848, at age 25, famously survived the passing of a tamping rod through the anterior of his skull and brain during a premature rock explosion. Damasio describes the event and Gage's tragic life from thereon, detailing the behavioural changes noted in various accounts. The second chapter tells of the reconstruction by Hanna Damasio of the extent and specificity of brain damage suffered by Gage through the use of the technologies of Magnetic Resonance Imaging (MRI) and the Brainvox technique. This grounds Damasio's argument that Gage did not experience damage to areas associated with motor function or language, associated with the posterior frontal lobes, but rather the ventral and medial prefrontal areas associated with 'normal decision making' (p. 32).

In chapter three the focus shifts from the 19th century to contemporary times with Elliot, Damasio's own case of a 'modern Phineas Gage' (p. 34). A boarded business man in his thirties, Elliot had a large meningioma (a benign type of brain tumour) surgically removed, this damaging, as with Gage, the orbital and medial areas of the frontal lobes. Damasio provides a detailed description of the process of assessment, demonstrating how Elliot

[5] Reasoning here, according to Damasio, is 'the ability to think and make inferences in an orderly, logical manner' (p. 269)

[6] For example: 'He [Gage] looks like a young Jimmy Cagney, a Yankee Doodle dandy dancing his tap shoes over ties and tracks, moving with vigour and grace' (p. 4).

performed at either a normal or superior level, in relation to the various norm groups, on a myriad of psychological and neuropsychological tests assessing the functions of visual and verbal attention, verbal and visual memory, language comprehension and production, visual perception and construction skills, arithmetic, working memory, general intelligence, and even generating a valid personality profile. However, like Gage, Elliot displayed remarkable deficits in his ability to decide effectively with regard to 'personal and social matters' (p. 43) and 'disaffectation' (p. 45), the latter indicating that he had the ability to '*know but not to feel*' (p. 45, emphases in original).

In the final chapter of Part One, Damasio provides further case examples. He then states the following 'provisional conclusions' (p. 61): i) Bilateral prefrontal cortex damage which includes the ventromedial aspects is 'consistently associated with impairments of reasoning/decision making and emotion/feeling' (p. 61). ii) When the deficit profile mostly indicates problems with reasoning/decision making and emotion/feeling, then the brain damage is usually limited to the ventromedial aspects of the frontal lobes. This is most strongly associated with problems in personal and social functioning. iii) When damage is coextensive for both the ventromedial and dorsolateral aspects of the frontal lobes then reasoning/decision making deficits are not merely limited to the personal/social domain but also then include deficits in attention and working memory (WM)[7]. Damasio then goes on, referring to both human and animal studies, to identify the right somatosensory cortex and both the amygdala as further sites associated with 'reasoning and the processing of emotion' (p. 71). Having drawn together these disparate physical areas and various functions, he closes the first part of the book by wondering '[w]hat can possibly be shared by planning and making personal and social decisions; processing emotion; and holding an image in mind, in the absence of the thing it represents?' (p. 79).

Damasio describes the second part of *Descartes' error* as a 'bridge' or 'traversal' between the 'facts' of the first part and the 'interpretation' of the third part, a part that he fears may

[7] Damasio defines attention as 'the ability to focus on a particular mental content to the exclusion of others' (a spatial function as such) and WM as 'the ability to hold information in mind over a period of many seconds and to operate on it mentally' (a temporal function) (p. 41).

be experienced as an 'interruption' (p. 85)[8]. The first chapter consists of numerous descriptions of key terms and relationships; organism, the body/brain relationship, the organism/environment relationship, images (their various types, perception, storage, and recollection), and dispositional representations (DRs). These terms will be discussed in more detail later. Prior to discussing various emotions and feelings in depth, linking these to the body, consciousness and the self (subjectivity), Damasio introduces the notion of biological regulation and the role of drives and instincts. Having laid this conceptual scaffolding across the first three chapters, whilst building on the case studies of Part One, Damasio then introduces his 'somatic-marker hypothesis' (p. 165):

> *[S]omatic markers are a special instance of feelings generated from secondary emotions*. Those emotions and feelings *have been connected, by learning, to predicted future outcomes of certain scenarios*. When a negative somatic marker is juxtaposed to a particular future outcome the combination functions as an alarm bell. When a positive somatic marker is juxtaposed instead, it becomes a beacon of incentive. (p. 174, emphases in original)

Briefly, *somatic markers* are a subtype ('a special instance') of *feelings*, which are defined as *perceptions* of changes in the body landscape. These changes that occur in that landscape are what Damasio refers to as emotions. Primary emotions are regarded as a set of 'innate' or 'preorganised' (p. 133) physiological responses, involving particular anatomical structures, to broad categories of stimuli. Secondary emotions are regarded as building on these primary structures and are 'acquired' (p. 137) or learned through the unique course of the organism's life and are thus triggered by more particular stimuli rather than broad cross-species predispositions. Thus we have a special type of feeling generated by changes particular to an individual organism's experiences. These particular feelings are associated, again through the unique learning history of the organism, with particular outcomes. The combination of outcome and positive or negative feeling then act as either an incentive or warning, making routes of action by the organism either more or less likely.

[8] Damasio thus draws an unproblematic distinction between 'fact' and 'interpretation' interestingly enough simultaneously troubling it with his 'bridge' section which seems to operate in a between or undecidable state which has potential, despite introducing numerous central concepts, to interrupt.

This is a vital point for Damasio, the one that links reason to emotion, that is, the body. The history of the organism's responses to stimuli are recorded or learned as a series of associations (what he calls 'dispositional representations' (p. 103)) between particular body landscapes and these scenarios. These associations, experienced as feelings, then impact on the reasoning process by either precluding or encouraging directions of action. Reasoning is therefore always already invaded by emotion, since this editing process via somatic markers enables reasoning to be more efficient. As Damasio states; '*The organism has some reasons that reason must utilise*' (p. 200, emphases in original).

The third part of the text consists of three chapters. In the first chapter, despite being part of the 'interpretation' part, empirical evidence is provided in support of the somatic marker hypothesis[9]. The next chapter is dedicated to discussions about the centrality of the body (as ground reference) and the notion of subjectivity and the (neural) self. In the short final chapter Damasio discusses his notion of a 'truly embodied mind' (p. 252) as a response to Descartes' error, this blunder being:

> [T]he abyssal separation between body and mind, between the sizable, dimensioned, mechanically operated, infinitely divisible body stuff, on the one hand, and the unsizable, unidimensioned, un-pushpullable, nondivisible mind stuff; the suggestion that reasoning, and moral judgement, and the suffering that comes from physical pain or emotional upheaval might exist separately from the body (p. 250).

Finally, in the Postscriptum, Damasio discusses his view of the role of science in contemporary society, specifically the promises and limitations of neurobiology and modern medicine. Throughout the text Damasio also provides a number of what he calls 'asides', at points discussing phrenology, the anatomy of nervous systems, neurochemical explanations, the architecture of neural systems, and altruism.

[9] See the discussion of the fact/interpretation binary in Chapter 4.

Having provided a sketch of the text I will now proceed to consider the various radical moves explicitly claimed in *Descartes' error* (1994), ones where Damasio troubles the distinction between the body/brain, the subcortical/cortical, and the organism/ environment. Then the temporal notions of reiteration, reconstruction, and reactivation, the spatial notions of multiplicity, and the spatial-temporal notion of juxtaposition as articulated by Damasio will be discussed. These sections then provide the scaffolding for the consideration of the troubling of this radicality and the identification of the points where Damasio returns implicitly to notions that he explicitly denounces.

CONTAMINATING THE MAINSTREAM

To act at the level of the radical is to go to the root of the matter; it is to try and identify the most fundamental assumptions at work in a field of interest and to challenge their legitimacy and utilisation (Heather, 1976). Damasio notes a number of exclusions and omissions from 'mainstream cognitive science' (p. 159) and 'respectable scientific accounts' which he indicates that he cannot 'endorse' (p. 158). He also notes that some distinctions operative in the field are products of a 'basic ignorance' and an 'unfortunate cultural inheritance that permeates society and medicine' (p. 40). Thus in *Descartes' error* we find a criticality not unlike that of critical psychology, where the radical movement is to include what has been excluded; an addressing of that which has been marginalised. In this section I will discuss Damasio's various radical moments; points where he identifies (and 'deconstructs') a number of problematic and inter-related binaries (i.e., emotion/reason, body/brain, subcortical/cortical, organism/environment) that function in the general rationality of the field of neuroscience.

As already touched on in the above introduction, the primary theme of the book is the challenge to the traditional distinction between *reason and emotion*. Emotion is that 'usually' regarded as a 'major source of irrational behaviour'; 'a supernumerary mental faculty, an unsolicited, nature-ordained accompaniment to our rational thinking', a 'luxury' if pleasurable but an 'unwelcome intrusion' if painful (p. 52). It is thus that which stands in excess of, in addition to, the vital function or melody of rationality. At best a luxury,

emotion is that which always threatens the ordered nature and logical inference that defines the process of reason.

It is through interpretations of various empirical case and anatomical studies (including Gage, Elliot, and numerous others) that Damasio challenges such a conceptualisation, indicating that that which is considered marginal is actually vital to the process of reasoning and decision making. For without the presence of emotion, as he demonstrates, for example, in the case of Elliot, the simplest and most practical daily decision becomes an endlessly long affair where various options are repeatedly weighed up and debated, a process without end. What Damasio points out is that in its concern with too much emotion, the academy has overlooked that a 'reduction in emotion may constitute an equally important source of irrational behaviour' (p. 53). Those, like Elliot, with even temperament, steady disposition, and a noticeable 'cold-bloodedness' (p. 51), could not engage in the decision making processes required to maintain efficiency in social and personal environments and so steadily find themselves excluded and marginalised (which may include being unemployed, isolated, and divorced)[10].

In this way Damasio provides a critique of absolute agency and pure reason. Reason does not stand above the body, in a dispassionate (disembodied) realm, but is contaminated and enabled by the body. That which is consciously considered during the process of reason has already been quietly evaluated and censored by the body in the form of somatic state/outcome associations. Damasio here joins Nietzsche, Freud and Derrida, in undermining the centrality or supremacy of reason, agency and consciousness.

Along with his dismantling of the clear division between emotion and reason, Damasio troubles several other binaries utilised in typical ways in the neurosciences. Amongst these is the distinction drawn between *the cortex and the subcortical structures* of the brain. The 'accepted' view (p. 127) would align the cortex with the 'higher' functions, such as reason,

[10] Damasio drives this point of the dysfunctionality of hypo-emotionality home in his discussion of 'developmental sociopathy or psychopathy' (p. 177) where he draws a link between the absence of emotion and sociopathy.

and the lower structures, those lying under the cortical mantle, with 'basic' functions such as the maintenance of various body indices within certain parameters (the homeostatic function). Here we then have quite a literal spatial placement of that considered more advanced and 'evolutionary modern' (p. 128) with the physically higher whilst that considered more base as hidden in the brain's depths, the 'old-fashioned subterranean' (p. 110). But Damasio disrupts this simplistic alignment; '[t]he apparatus of rationality, traditionally presumed to be *neo*cortical, does not seem to work without that of biological regulation, traditionally presumed to be *sub*cortical' (p. 128, emphases in original). Reason is not exclusively cortical, a free or transcendent realm (an independent software) resting on a material life support system (an interchangeable piece of hardware) which works away unobtrusively in the basement but, rather, is both subordinate and moulded by this other.

A number of binary oppositions[11] are utilised in the articulation of this general structure of the brain: The subcortical is portrayed as 'evolutionary old' (p. 109), 'subterranean' (p. 110), 'innately and precisely set' (p. 110), and enacting a 'fundamental set of preferences of the organism that consider survival paramount' (p. 111). In contrast, the cortical is 'evolutionary modern' (p. 110), 'a comprehensive mantle' covering all surfaces (p. 27), comprised of 'acquired' (p. 111) and 'plastic' circuits (p. 110) which are 'experience driven' (p. 111), secondary to and dependent on the subcortical circuits which complement, constrain, and 'interfere with' (p. 111) the 'shaping of the more modern and plastic' (p. 111) circuits. The higher functions are, as indicated, subject to the lower functions. In this way Damasio historicises the organism[12] since '[w]holesale modifiability would have created individuals incapable of recognising one another and lacking a sense of their own biography' (p. 112). That is, there would then be nothing stable, nothing which endures, a radically fickle self which is no self at all. Where the higher allows adaptation to the contingencies of the environment, the lower provides 'nuts-and-bolts biological regulation' allowing 'individual and evolutionary survival' (p. 110). Thus the brain 'needs a balance between the circuits whose firing allegiances may change like quicksilver, and circuits that

[11] These being: old/new, below/above, innate/acquired, precise/plastic, and primary/secondary.

[12] And in this way provides a critique of naïve postmodern readings of the body. See Chapter 4 for a discussion of this portrayal.

are resistant though not necessarily impervious to change' (p. 113), but which ultimately evaluate and shape those above according to a 'fundamental set of preferences… that consider survival paramount' (p. 111).

The problem with this articulation is that although it troubles the transcendence of the cortical, it leaves some aspects intact; the subcortical constrains the cortical but the cortical itself is then left simply subjugated. That is, it is an inversion restating an Aristotelian point that we are fundamentally creatures of the earth and not a metaphysical ideality but it is not a displacement. Such a displacement could be argued as follows: There is here a distinction between plasticity and endurance, where endurance (the subcortical) is primary[13]. And yet it is plasticity that is essential to deal with the plasticity (changeability) of the environment. That is, (a more general) endurance at an organism and species level is enabled by this cortical plasticity – it is admittedly a (necessarily) constrained plasticity but one still essential for the endurance of both the organism and species.

Damasio troubles categorisations (and in the process Enlightenment and metaphysical ideals) that attempt to draw bold lines between reason and emotion, or which promise ascendancy, if not transcendence, to 'upper' structures that are actually ascribed to (bought back to earth and temporality) by 'lower' structures. He extends this further by smudging the line between the *body and brain*. Damasio describes a tradition of neural reductionism, a perspective that tends to view the brain in isolation from the remainder of corporeality. Here, the so-called 'brain in a vat' (p. 227) is seen to be capable of 'normal mental experiences' (p. 228). Instead Damasio argues that it would in no manner approximate the mind of the embodied person. The reason for this is that, to use his distinction, the 'body proper' (p. 86) and the brain cannot be separated. The body and brain are '*indissociably integrated*' (p. 87, emphases added), forming an 'indissociable organism' (p. xvi). Damasio adds rhetorical punch to this by indicating that by using such a characterisation, he is in fact 'oversimplifying' (p. 88) the case.

[13] A distinction which, as we will see the chapter on Joseph LeDoux's *Synaptic self* (Chapter 7), is gross and empirically inaccurate.

Using an example, in a section entitled *No body, never mind* (pp. 223-225), Damasio describes the plethora of changes (including, moment-by-moment biochemical and musculature adjustments) and 'complex cycles of interaction' (p. 224) (including neural and bloodstream routes) that occur across and between the body proper and brain. He indicates that '[d]espite the many examples… body and brain are usually conceptualised as separate in structure and function' (p. 224). What is discounted is that 'the entire organism rather than the body alone or the brain alone… interacts with the environment' (p. 224). He thus seeks a more intimate understanding of the organism, one that does not locate the body as a passive intermediary between the environment and brain, rather it is the organism as a whole 'that *acts* on the environment' (p. 225, emphasis in original). This counters an understanding of the body as a passive reactionary mass, but sees it as an active materiality, one where attempts to reduce its vitality to the brain, and thus reinstating a Cartesian duality, has to ignore the complex and intimate nature of the processes that cut across not only the brain and the rest of the body, but *the organism as a whole and the environment*.

Damasio (p. 251) draws the above together in the following passage:

> There may be some Cartesian disembodiment… behind the thinking of neuroscientists who insist that the mind can be fully explained solely in terms of brain events, leaving by the wayside the rest of the organism and the surrounding physical and social environment – and also leaving out the fact that part of the environment is itself a product of the organism's preceding actions.

Here Damasio makes the same point as Wilson (1998) that a Cartesian ambition underlies the 'mind as software program' (p. 250) metaphor of neuroreductionism, one that once again disembodies the mind as it claims to include the materiality of the brain. What Damasio sets about to return to the scene are the body and the environment, in both its social and physical forms, making, in the above quote, the Marxist point that the effects of the organism are always and already to be seen in the environment in which it is immersed.

In summary; Damasio challenges several traditional conceptualisations found in neuroscience; those i) where emotion is divorced from reason, ii) where reason is equated with the cortical, and where understandings of the brain ignore its profoundly intimate relationship with iii) the body and iv) the environment. He thus counters both metaphysical distinctions (mind/body) and neuroreductionism (mind as brain). In the process a theme of intimacy is placed in the foreground; 'the mind exists in and for an integrated organism' (p. xvi), it 'derives from the entire organism as an ensemble' (p. 225), and is constituted of 'physiological operations… derived from the structural and functional ensemble rather than from the brain alone' (p. xvii). Damasio however exceeds this definition in indicating that 'mental phenomena can be fully understood only in the context of an organism's interacting in an environment' (p. xvii). The mind thus exceeds the parameters of the corporeal.

Damasio defines mind as essentially 'the ability to display images internally and to order those images in a process called thought' (p. 89). His argument is that the emergence of a minded organism, one capable of such 'imaging'[14], enhanced the ability of the organism to survive, given that it allowed the perception of greater external detail, the 'refinement of motor responses', and the 'prediction of future consequences' (p. 229). Furthermore, [m]ind is probably not conceivable without some sort of *embodiment*' (p. 234, emphasis in original). Such 'representations' had to be of the body proper, it was body that was initially minded, ensuring better survival by '*representing the outside world in terms of the modifications it causes in the body proper*' (p. 230, emphasis in original), this via a 'dynamic set of maps' (p. 231) representing the overall organism. Even though mind may now be 'dominated by non-body images' (p. 234), it was, for Damasio, the utility of imaging the environment's effects on the body that lead to its establishment. So, it 'is not only the separation between mind and brain that is mythical: the separation between the mind and body is probably just as fictional. The mind is embodied, in the full sense of the term, not just embrained' (p. 118). Vitally this does not mean that the mind is equal to the body but that the mind emerges out of more than the brain; it emerges out of the body *immersed in the environment*.

[14] The notions of 'images', 'maps' and 'representations' will be examined in the next section.

RAUM UND ZEIT: MULTIPLICITY AND REITERATION

Damasio's challenge to a particular conceptual tradition in neuroscience has been clarified. Related to this is the introduction of several notions that are articulated on numerous occasions across the book, this including the temporal concept of reiteration, the spatial concept of multiplicity, and the spatial-temporal notion of juxtaposition. These radically accentuate the intimacy between brain, body and environment touched on in the previous section. A discussion of these themes is then the focus of this section which provides a foundation for the remainder of the chapter.

Repeatedly identifiable in *Descartes' error* is the temporal theme of *reiteration* (p. 197), which also presents itself by a several other nicknames; 'perpetual recurrence' (p. 93), 'continuous updates' (p. 144), 'reconstruction' (p. 105), regeneration (p. 106), and reconstitution (p. 108). This notion of repetition (*re-*, once more, again, anew, afresh) emerges in a number of contexts (Sykes, 1978). For example, in his discussion of neural architecture, Damasio refers to the existence of 'feedforward and feedback projections, which can create a *perpetual recurrence*' (p. 93, emphases added). Other instances involving feelings, memory, working memory and the self will be discussed below.

Referring at times to the 'organism' (p. 235), and at other moments to the 'body' (when he wants to bring the 'brain' into view), Damasio characterises corporeality as continuously shifting, as being in constant flux, a condition where 'there is change, ceaseless change' (p. 144). 'Living organisms are changing continuously, assuming a succession of "states", each defined by varied patterns of ongoing activity in all of its components' (p. 87). But 'a state', is 'an artificial, momentary slice of life, indicating what was going on in the various organs of a vast organism during the time window defined by the camera's speed' (p. 87). As an image, a photograph, state is positioned as 'artificial' against the 'real' of the ever shifting body. Given this, the idea of repetition in the text does not refer to this 'body' but rather comes into being when referring to the 'brain' which incessantly generates updated neural representations, generating *continuous updates* of this changing landscape; 'a "view" of the ever-changing landscape of your body' (p. 144), 'a *dynamic*, *newly instantiated*, "on

line" representation of what is happening in the body now' (p. 144, emphases added), a 'composite, *ongoing* representation of current body states…' (p. 151, emphases added). In the above quotes a number of metaphors are utilised; that of the body as 'landscape', the brain as computer ("on-line")[15], and the link between body and brain is depicted as symbolic ('representation'). The brain is thus an elsewhere that provides 'views' of the body landscape, and these views are only momentary. Damasio indicates this directly; the '"view"' (p. xv) of the body landscape is 'momentary' (p. xiv), there are 'successive organism states, each neurally represented anew, in multiple concerted maps, *moment by moment*, and each anchoring the self that exists at any *one moment*' (p. 235, emphases added). This window 'onto a *continuously updated* image of the structure and state of our body' (p. xiv, emphases added) is the essence of feelings.

The triple characterisation of the endless, momentary and new is illustrated in Damasio's discussion of anosognosia. This is a condition accompanying some forms of brain damage where the person is oblivious to their deficits, say hemiplegia following a stroke. Damasio understands this as a deficit in reiteration, where the body 'image' or 'representation' is not updated. It refers to an 'inability to sense the defect automatically, rapidly, and internally' (p. 63). The failure to update, resulting in an 'outdated' image (p. 154), a body image 'woefully, irrevocable out-of-date' (p. 155), results in a person out of time or, rather, stranded in time, a partial amnesiac. This depicts the anosognosic as an island within the body, and signifies a fragile self, a fragile materiality, easily disconnected, not essentially fragmented but contingently fragmentable.

With regard to memory similar themes emerge. Damasio indicates that the 'appearance of an image in recall results from the *reconstruction* of a *transient* pattern (metaphorically, a map) in early sensory cortices, and the trigger for the *reconstruction* is the activation of dispositional representations elsewhere in the brain, as in the association cortex' (p. 105, emphasis added). The notion of 'dispositional representations' is core here and are

[15] Damasio's use of quotation marks should be noted here; "view" is placed in such markings but 'landscape' isn't, whilst, similarly, "on-line" is whilst 'representation' isn't. In this way a critical distance is introduced from the ocularcentrism of "view" and the computational inferences of "on-line", whilst the body as landscape (which is still something to be viewed) and the characterisation of the neural activity that resonates with shifting body states as 'representation' are metaphors smoothed into the narrative.

conceived as ‘potential patterns of neuron activity in small ensembles of neurons’ which, as indicated, re-evoke neural patterns in sensory cortical areas. ‘I believe those representations are *constructed momentarily* under the command of acquired *dispositional* neural patterns elsewhere in the brain’ (p. 102, emphasis in original). These dispositional representations are ‘a means to *reconstitute* “a picture”’ (p. 102, emphasis added), they allow ‘the *momentary reconstruction* of an approximate representation' (p. 102, emphases added). Notably, dispositional representations themselves are not static traces but are subject to ‘*continuous modification*’ (p. 105, emphases added) as new knowledge is acquired.

With ‘basic working memory’ the theme of repetition emerges again. Damasio refers to the capacity to hold ‘separate images for a relatively “extended” period of hundreds of thousands of milliseconds’ (p. 197). This is achieved since the ‘brain *reiterates* over time the topographically organised representations supporting these separate images’ (p. 197, emphasis added). Corporeality enters here in that the bodily response determines the degree of reiteration of a representation; ‘a somatic marker, negative or positive, caused by the appearance of a given representation, operates not only as a marker for the value of what is represented, but also as a booster for continued working memory and attention’ (pp. 197-198).

Finally, referring to the self, this is regarded as ‘a *repeatedly reconstructed* biological state’ (pp. 226-227, emphases added). This is achieved via the ‘continuous reactivation of at least two sets of representations’ (p. 238), one being the ‘representations of key events in an individual’s autobiography, on the basis of which a notion of identity can be reconstructed repeatedly, by partial activation in topographically organised sensory maps’ (p. 239), the second being ‘primordial representations of an individual’s body’ (p. 239). Thus ‘at each moment the state of self is constructed, from the ground up. It is an evanescent reference state, so continuously and consistently *re*constructed that the owner never knows it is being *re*made unless something goes wrong with the remaking’ (p. 240, emphasis in original). Here ‘current body states [are] incorporated continuously in the concept of self and promptly become past states’ (p. 240).

Throughout this process of endless reconstitution, a theme of 'difference' can be discerned, it is the 'momentary reconstruction of an *approximate* representation' (p. 102, emphasis added). In the discussion of '"as if" feelings' these are indicated to 'feel different' (p. 156); 'as if' feelings are a 'fixed repertoire of emotion/feeling patterns, which would not be modulated by the real-time, real-life conditions of the organism at any one moment' (p. 158), they should be understood as a 'rebroadcast'. In contrast, '[w]hat is played out in the body is constructed anew, moment by moment, and is *not an exact replica* of anything that happened before', a set of 'live performances' (p. 158, emphases added). With the 'circuits that help us recognise our face in the mirror today, without surprise, have been *changed subtly* to accommodate the structural modifications that the time spent has given those faces' (p. 113, emphases added). The subtype of background feelings are regarded as being about body states that create an 'island of *illusory living sameness*' (p. 155, emphases added) on which our individual identity is anchored. The Derridean theme of identity and difference is noted here, as each reiteration (lasting but an instant) brings difference within the context of stability and, vice versa, stability within the context of difference. When Damasio refers, in his case studies, to the note that 'Gage was no longer Gage' (p. 8) or, later, that 'Elliot was no longer Elliot' (p. 36), he is referring to the changes in interactional style, affect and decision making associated with ventral medial frontal lobe damage. But there is also then a more fundamental instability which he continuously refers to in his work, that of a process where we are each not who we were a moment before as we are each continuously reiterated, updated, and made anew; a dynamic stability.

The above temporal theme finds its spatial sibling in the idea of *multiplicity*. This theme arises continuously across the text in, for example, references to 'several brain systems' (p. xiii), 'multi-component systems' (p. 244), 'multiple systems' (p. 15), 'separate maps' (p. 66), 'numerous brain systems' (p. 227), 'several brain regions' (p. 230), and so forth. These all articulate Damasio's emphasis on the mind emerging from the brain multiplex in contrast to the 'Cartesian theatre' which relies on a 'single brain structure' (p. 94). As Damasio indicates; 'I am in no way suggesting that *all* the contents of our mind are inspected by a single central knower and owner, and even less that such an entity would

reside in a single brain place' (p. 238). The image of spatial configuration indicated by these terms is furthermore combined with an emphasis on specificity, where the function of a component depends on its location or place in space, and a temporal image of components working in concert (e.g., 'concerted operation' (p. 15), 'simultaneity of activity' (p. 84), 'synchronising sets of neural activity' (p. 95), 'temporally coordinated patterns' (p. 231)). These themes are illustrated below.

The theme of multiplicity emerges with reference to many concepts (feeling, reason, knowledge, self, mind, body map): With regard to feelings, these 'seem to depend on a dedicated *multi-component system* that is indissociable from biological regulation' (p. 244, emphasis added). Similarly, 'human reason depends on *several brain systems*, working in concert across many levels of neuronal organisation, rather than a single brain centre' (p. xiii, emphases added). Knowledge 'can be retrieved only in distributed, parcellated manner, from *sites in many parallel systems*' (p. 84, emphases added). 'For the biological state of self to occur, *numerous brain systems* must be in full swing, as must *numerous body-proper systems*' (p. 227, emphasis added). Likewise, the 'mind results from the operation of each of the separate components, from the concerted operation of the *multiple systems constituted by those separate components*' (p. 15, emphases added). These 'numerous systems [are] located in relatively *separate brain regions* rather than in one region' creating 'the illusion that everything comes together in a single anatomical theatre' (p. 84, emphases added). Rather than 'what is together in the mind [being] together at one place in the brain where different sensory aspects mingle', the so-called 'Cartesian theatre' (p. 94), 'there is no single region in the human brain equipped to process, simultaneously, representations from all the sensory modalities active when we experience…' (p. 95). Specifically, with regard to the body; the 'dynamic map of the overall organism anchored in body schema and body boundary would not be achieved in one brain area alone but rather in *several areas* by means of temporally coordinated patterns of neural activity' (p. 231). Thus this multiplicity refers to a *distribution* of function across anatomical space. With reference to primordial representations, these, 'are distributed over several brain regions' (p. 230), whilst with acquired representations, such as Damasio's example of Aunt

Maggie's face: 'She is distributed all over it [the brain], in the form of many dispositional representations, for this and that' (p. 103).

Two further aspects of this multiplicity are noted: The first is that this distribution is not arbitrary but multiple locations forming coordinated sets of activities or systems allowing the emergence of complex (or higher) functions and phenomena. 'What determines the contribution of a given brain unit to the operation of the system to which it belongs is not just the structure of the unit but also its *place* in the system' (p. 15, emphasis in original). With neuron clusters, 'whatever each assembly contributes to the function of the system to which it belongs *depends on its place* in that system (p. 30, emphases added). That this is not arbitrary, that functionality depends on location, is indicated by the force of Damasio's comment on those who 'prefer to hide behind the notion that everything connects with everything else': 'Fortunately, they are wrong' (p. 29).

The second refers to these multiple locations working in a closely coordinated fashion allowing the emergence of complex phenomena and functions: Thus 'human reason depends on several brain systems, *working in concert* across many levels of neuronal organisation' (p. xiii, emphases added), whilst, more broadly, the mind results 'from the *concerted operation* of the multiple systems constituted by those separate components' (p. 15, emphases added). Mind integration 'is created from the concerted action of large-scale systems by *synchronising sets of neural activity* in separate brain regions, in effect a trick of timing' (p. 95, emphasis added). Specifically, body maps are 'coordinated by mutually interactive neuron connections' (p. 144). 'This dynamic map of the overall organism anchored in body schema and body boundary would not be achieved in one brain area alone but rather in several areas by means of *temporally coordinated patterns of neural activity*' (p. 231, emphases added).

Finally, what multiplicity allows is contrast, a possibility highlighted by Damasio's repeated utilisation of the notion of *juxtaposition*. What are contrasted are 'images', that of the body and various others, be these of 'something else, such as the visual image of a face or the auditory image of a melody' (p. 145), 'certain body states with whatever thoughts'

(p. 146-147), body structure representations and 'body states now' (p. 152), 'combinations of entities and events' (p. 196), or 'somatic markers' and 'different combinations of images' (p. 199). In his discussion of subjectivity, Damasio articulates this process in detail:

> [A]n object is being represented, an organism responding to the object of representation, and a state of self in the process of changing because of the organism's response to the object – are held simultaneously in working memory and attended, *side-by-side or in rapid interpolation*, in early sensory cortices. I propose that subjectivity emerges during the latter step when the brain is producing not just images of an object, not just images of organism responses to the object, but a third kind of object, that of an organism in the act of perceiving and responding to an object. I believe that the subjective perspective arises out of the content of the third kind of image. (pp. 242-243, emphases added)

The above quote highlights that this process of juxtaposition is both temporal and spatial. Elsewhere: 'the image of the body proper appears *after* the image of "something else" has been formed and held active, and because the two images remain separate, neurally… In other words, there is a "combination" rather than a "blending"' (p. 146). Also body structure 'representations are "off line", or dispositional, but they are activated into the topographically organised somatosensory cortices, *side by side* with the on-line representation of the body states now, to provide an idea of what our bodies tend to be like, rather than what they are now' (p. 152, emphases added). Contrast is thus established by the 'combination' of multiple sites, neurally distinct, activated both simultaneously (synchronic) and across time (diachronic).

The above analysis of *Descartes' error* thus presents us with a striking image of our corporeality. It is one which portrays an active materiality, where complex phenomena, such as reasoning, recollection and perception, emerge as a result of an intimate interaction, cooperation and synchrony between multiple and distributed anatomical and environmental components. Here efforts to simplistically separate the subcortical from the cortical, the

brain from the body, the organism from the environment, or the mind from the body, are regarded as attempts to undermine a profound intimacy. The body is characterised as a ceaselessly changing and dynamic mass, whose state the brain (the neural) endlessly 'represents' ever anew from one moment to the next. The theme of difference is central to understanding Damasio's work as it is through continuous reiteration across time and juxtaposition between multiple sites, that is, through the marking of difference from one instant to the next and between one 'image' and another, that a continued intimacy between corporeality and the environment is possible. Damasio thus articulates a profoundly immersed body, one where the line that demarcates it seems in danger of being erased.

REINSERTING THE HOMUNCULUS

At several points throughout the text Damasio explicitly counters a particular reading; one which wishes to introduce a homunculus[16] or some exterior viewing point to the ceaseless activity of the organism. Referring to the continuously reiterated 'representation' of the body in the brain, Damasio states that '[t]here is nothing static about it, no baseline, no little man[17] (sic) – the homunculus – sitting in the brain's penthouse like a statue, receiving signals from the corresponding part of the body' (p. 144). Instead there is only ceaseless change, continuously represented across many 'maps' of the body across brain structures connected via mutually interactive neuron connections. There is then no place, no (meta)position, outside of this change and activity.

In his discussion of subjectivity, Damasio states that 'we must discover how the constantly and properly modulated body representations become subjective, how they become part of the self that owns them'. However the question is then: 'How can we explain such a

[16] The agentive and perceptive homunculus described by Damasio should not be confused with the sensorimotor homunculus, the 'point-by-point projection of the outside of the body in its entirety' (Grosz, 1994b, p. 34) on to the cortical surfaces of the (motor) frontal lobe pre-central and (sensory) parietal lobe post-central gyri.

[17] It is interesting that Damasio uses the masculine pronoun when referring to the homunculus, since in its creation of a being standing outside looking in, in its positing of an objective viewing point, it reasserts a patriarchal fantasy of objectivity and the body as object (Morgan, 2005). Grosz (1994b) also notes that the sensorimotor homunculus is '*explicitly* described as male' (p. 35, emphasis in original).

process neurobiologically, without resorting to the convenient tale of the homunculus perceiving the representation?' (p. 161). Thus what is to be avoided is the positing of an entity that stands outside of materiality and looks in. Rather,

> the self is a repeatedly reconstructed biological state; it is not a little person, the infamous homunculus, inside your brain contemplating what is going on. I mention that little man (sic) again only to let you know that I am not relying on him (sic). It does not help to invoke a homunculus doing any seeing or thinking or whatever in your brain, because the natural question is whether the brain of that homunculus also has a little person in his brain doing his (sic) seeing and thinking, and so on ad infinitum[18]. That particular explanation, which poses the problem of infinite regress, is no explanation at all. (pp. 226-227)

Cleary then for Damasio the creation of an entity (something looking in) or an outside (a transcendent or metaphysical viewing point) on the inside is not an explanation. It avoids rather than addresses the problem. And yet, as I will now show, Damasio continuously implicitly reinserts an outside throughout the text, contradicting the above explicit claims. It is a strain which results from, amongst other things, a problematic utilisation of ocularcentric concepts. Here I will argue that terms found in *Descartes' error*, such as 'representation', 'perception', 'map' and 'image', reveal a tension in the text. All imply an outside position, and thus undermine or contradict Damasio's explicit exclusion of the homunculus and the external stable viewing position it implies. Such discourse may be understood as standing in opposition to the radical notion of difference that is detailed in the text and discussed in the previous section. These terms implicitly imply i) an other (a homunculus) and thus, necessarily, ii) an outside position and iii) something to be looked at. What does this tension reveal? Is there a need for such terminology given Damasio's model? Why should sets of neural and other perturbations, standing in relations of temporal and spatial difference to each other, require Damasio to resort to a representational discourse? What do such concepts bring to the text except metaphysical distractions where an observing other still quietly peeps through the keyhole having been

[18] What Damasio refers to, in a footnote on the same page, as 'the creation of a nest of Russian dolls' (p. 227).

asked to leave the party by the host? Why do we need to proceed beyond neural circuits that are 'perturbed by stimuli from the physical and sociocultural environments' (p. 226) to include such terms? I will consider each of these notions in the order indicated above, followed by a discussion of the implications of the use of spatial-geographic and ocular metaphors in the text.

The term *representation* may be used in several senses: First, as indicating something that stands in for something else, that is, a substitutive or *symbolic* process. This then introduces a signifier/signified distinction and thus presupposes a metaphysics of presence (Cilliers, 1998)[19]. Second, as an *icon*, the representation of something else, as in an image such as a photograph or painting. Third, it may also be used in a *causal* sense; the utilisation of the term Bennett and Hacker (2003) argue is implied in neuroscience in general. The first two conceptualisations in the context of *Descartes' error* create a tension (as do the iconic terms 'image' and 'map'); they posit an outside position since someone is needed to consider the symbol or picture. The excluded homunculus is thus implicitly re-introduced despite being overtly denounced.

In order to develop the above argument, it should be asked how the notion of 'representation' is used in *Descartes' error*. The first thing that may be noted is that Damasio, when using such terms, is here referring to neural, not mental, activity. Neural representations are of a more general nature than images which are the experience of some of these representations, those in the early sensory cortices. Consider the following passage where Damasio discusses mind:

> Herein lies the centre of neurobiology as I see it: the process whereby biological modifications created by learning in a neural circuit, become image in our minds; the process that allows invisible micro-structural changes (in cell bodies, dendrites,

[19] In considering a different reading of the term, that of *repetition*, the very notion of something being *re*-presented, also implies the existence of an original presentation or presence. This distinction is echoed in the contrast between memory (*re*-collection) and perception which is addressed in the penultimate section.

> axons and synapses) in neural circuits to become a neural representation, which in turn becomes an image which we can experience as belonging to us (p. 90).

The first thing that should be noted is the metaphoric use of 'learning', where this actually indicates a modification in neural activity via interaction with the environment; it is a modification of the neural circuitry in response to being perturbed by the outside (the non-neural). It is clear that there is no actual organism learning here, a neural circuit is not an organism but part of it. Again the use of such metaphors quietly imply the presence of an other; a homunculus. This also raises the question of whether one can or should refer to a modification in circuit activity as a 'representation', since one can immediately ask represented for whom? In contrast Damasio's term, 'perturbation', which does not imply a picture or homunculus also does not loose the relational aspect of what happens, that is, that there is a dynamic connection between external events and neural circuits. Damasio is not talking about a picture (icon) or a substitution (symbol) here but really, as indicated, a neural response to an external event (somatic or environmental); a neural element that resonates with other elements. We may then ask whether, in conceptualising an indissociable organism which requires no other or external viewing site, does this representational discourse not hinder this thesis and indicate a metaphysical (in the sense of attempting to step outside the ceaseless activity of materiality) remnant? Or is this reading of this discourse as obfuscation itself problematic? I will return to this point later.

In the text, representations are characterised as either acquired through experience or innate, that is, passed on from one organism to another somatically (as opposed to culturally), implying a 'representation' common to all members of a species. Furthermore, they may be categorised as *topographical*, which are always innate, or dispositional, which may be either innate or acquired. In the former they are located within the early sensory cortices and used in the sense that they map out the particular sensory field, be that, for example, visual or auditory. Here then the notion of representation is used in a straight forward manner, the neural activity of these cortices re-present in a pretty strict one-to-one manner an aspect of external reality. The problem with such a conceptualisation will be

indicated later in the discussion of perception since in this sense 'perception' and 'topographical representation' are synonyms.

With regard to dispositional representations (DRs) these 'are not topographically organised' (p. 103) but are a record of an event. As previously indicated, dispositional representations exist as *potential patterns of neural activity* in neural assemblies called convergence zones. Their reactivation may lead to the reactivation of other DRs, early sensory cortices, or motor cortices. It may be asked why one should feel obliged to use a term such as 'representation' when speaking of activity patterns that, by Damasio's own definition, cannot be directly experienced. Surely this again implies an other that quietly views these DRs outside of consciousness? DRs are the structural consequences of past events; they indicate neural activity modifications in relation to previous occurrences or perturberances. They demonstrate an intimate relationship with structures and processes outside of neural circuits and structures, but then there seems no need to use a burdened notion like representation.

As with all the terms discussed here, *perception* implies an other, a perceiver; one that considers (perceives), for example, the body or extra-corporeal landscape. Thus, with regard to the former, '[y]ou perceive changes in your body state and follow their unfolding over seconds and minutes' (p. 145). As previously indicated, Damasio regards 'feelings', the experience of emotions, as a form of perception. When we 'feel' we perceive the body landscape, an experience akin to seeing. Perception may thus be of the world or of the body, the extra-neural as such. This always involves the transfer of signals via neuronal activity from a body sector to the '*collection* of areas' (p. 99, emphasis in original) called the early sensory cortices. These cortices form 'topographically organised representations' (p. 99); point by point maps of what is being perceived. Damage to these cortices results in the absence or modification of the ability to form 'images', the conscious experience of representations, in the particular sensory modality affected. Perceptual images are 'images of now', 'constructions of your organism's brain' (p. 96) of the present external and internal circumstances. This seems rather unproblematic and obvious but I wish to point out that this notion does not have to be read as: i) representational (one-to-one mirroring,

that is, iconic), ii) an attribute of the brain, iii) being of the present, iv) the 'processing of stimuli' (Cilliers, 1990, p. 5), or v) implying a stable outside position.

First, since Damasio indicates that perceptual images are 'constructions' this implies that the process of 'topographical representation' involves an interpretive element. This undermines a reading of perception as a perfect one-to-one representation (a simplistic mirroring process), that is, it introduces the movement of difference into this neural process. This seems quite obvious since when we see a house we do not rebuild a house as such in our minds or brains and there is thus always already a difference. This claim will be developed in the penultimate section where the relationship between perception and memory will be addressed.

Second, to argue that *the brain* perceives (the body landscape – the internal milieu - or the external world) is to commit an error or misattribution common to the neurosciences, referred to by Bennett and Hacker (2003) as the *mereological fallacy*[20], where an attribute of the organism is attributed to an aspect of the organism. It is the person, the organism as an entirety, which decides, perceives, remembers, and so forth – a point that resonates with Damasio's emphasis on the embodied mind. To imply that a set of neural circuits does any of these things is then a form of neurological reductionism that Damasio overtly opposes.

Third, as just mentioned, I later provide a disruptive reading of the distinction between perception and memory. The basic point is that there is no neat distinction between these two notions. Focussing on perception, it is pointed out that this process does not occur on an entirely new neurologically fresh terrain but is only possible due to a neural structure formed across the developmental span of both the species and the individual organism. Therefore the past always invades, actually structures, the experience of the present: When we perceive we remember in that structures formed in the past are reactivated. Cilliers (1990), using Derrida's reading of Freud's model of the mystic writing pad, describes perception as 'an interaction between stimuli from outside and the unconscious substrate of memory' (p. 5).

[20] See Chapter 2.

> Perceptual stimuli enscribes the traces in memory, but they are not perceived as such. Perception is the delayed interaction of newly arrived traces with already present ones. It is not a processing of stimuli, but the *différance* of traces. (Cilliers, 1990, p. 5)

Various extra-neural stimuli cause neural modifications. We do not experience these modifications directly. Rather perception *emerges* from the contrast between the various modifications, new and old, that comprise the brain. This reading of Freud's model resembles Damasio's notion of juxtaposition. Perception is not the experience of circuits but emerges from the contrast (the juxtaposition) between these areas of activity. The activation of early sensory cortices is a 'construction' of the external (extra-neural) world and thus immediately introduces an element of difference, both as a relationship with some new external circumstance and as a *re*-activation of a circuit. Such an area of activity, in turn, stands in contrast (difference) to other neural activation patterns, whether 'recollective', 'perceptual' or whatever. This conceptualisation of perception is thus not a simple process of serial information processing nor, since it emerges from the ceaseless contrast of activities, does it imply an outside position of stability. This radicality inherent in Damasio's reading of corporeality stands in contrast to terms such as 'image' and 'map'.

As Damasio indicates, mind involves 'the ability to *display images internally* and to order those images in a process called thought. (The images are not solely visual; there are also 'sound images', 'olfactory images', and so on.)' (p. 89, emphases added). Furthermore: *'Images are based directly on those neural representations, and only those, which are i) organised topographically and ii) which occur in early sensory cortices'* (p. 98, emphases in original). Images, the experience of particular 'representations' (being activated neural circuits), emerge through recollection and perception and are not stored; rather their co-ordinates are kept in the form of DRs. Since perception as 'image' implies consciousness and thus a perceiving subject, this at first seems to not step into the problematic of creating an outside. When we perceive do we not experience images? However, when the term 'image' is used to refer to us experiencing, it immediately inserts a distance; I watch an

image rather than have an experience (Bennett & Hacker, 2003). This thus undermines the intimacy Damasio so carefully articulates across the text. The ocularcentrism of using a term such as 'images' will be discussed later, for now I make the point that to use terms such as 'display images internally' immediately implies a homunculus and a theatre.

The notions of '*maps*', 'representations' and 'images' are used in several ways relative to each other across the text. In relation to 'representations', the term 'map' as a verb is indicated when parts of the brain are said to 'map' signals from the body (p. xiv). This is similar to the *causal* sense of representation noted previously. Used as a noun (and thus in an iconic sense) 'maps' and 'representations' act as synonyms; as in when the body is represented in 'topographically organised sensory maps' (p. 239). At other moments Damasio combines the terms, as in 'mapped representations' (p. 239), probably to differentiate these from DRs. As such then the term is open to the same comments made of 'representations' above. When referred to as 'dynamic body maps' (p. 152), the term as noun, is open to the same critique as 'images' in that it implies an outside (on the inside) and an observer.

I will draw the various comments in the above section together by briefly referring to the work of Bennett and Hacker (2003). Their analysis of problematic conceptual practices in neuroscience helps clarify the existence of two difficulties in Damasio's text: i) When we perceive we perceive a representation or image or map of the world and not the world itself (what I call the homunculus problem since it immediately requires the reinscription of such an entity), and, ii) that terms such as 'representation' (and I include here 'map' and 'image') tend to easily slip into an *iconic* or *symbolic* rather than *causal* utilisation of the term (though, given the deterministic sheen of 'causal', I here prefer Damasio's term 'perturberance'), thus misrepresenting the relationship between neural, somatic and environmental elements.

With regard to the first point: The use of terms such as 'picture' or 'image' is referred to by Bennett and Hacker (2003) as a 'representionalist view' (p. 138). They argue that it is

'misguided' to think that 'what is seen (or heard, etc.) when we see (or hear, etc.) something is a *picture* or *image* (visual or auditory)' (p. 138, emphases in original).

> What one perceives by the use of one's perceptual organs is an object or array of objects, sounds and smells, and the properties and relations of items in one's environment. It is a mistake to suppose that what we perceive is always or even commonly, an image, or that to perceive an object is to *have* an image of the object perceived. One does not perceive images or representations of objects, unless one perceives paintings or photographs of objects. (Bennett & Hacker, 2003, p. 138, emphasis in original)

That is, to introduce notions such as 'image', 'representation' or 'map' is to re-introduce the problem of the homunculus since it is to introduce an unnecessary layer of terminology. To exclude such terms is not to deny that there is an intimate relationship between neural and somatic and environmental activity; it does not exclude the fact that neural circuits are perturbed by such events. Map and representation, as nouns, are used above as synonyms for mental image. To say that something is 'mapped' or 'represented' neurally, that is, to use the terms as verbs, is not to talk phenomenologically but is to use them differently and implies an intimate relationship between somatic and environmental objects and events and neural structure and activity. It is still however problematic to use these terms since it so easily suggests a pictorial (iconic) relationship, rather than indicating a structured or ordered relationship between these elements.

With regard to this second point, Bennett and Hacker (2003) distinguish a '*causal* sense of representation' (p. 142) from other senses:

> For the sense in which the excitation of a group of cells represents a certain feature in the visual field is the sense in which a wide ring in a tree trunk represents a year with ample rainfall, and that has nothing whatsoever to do with the *lexical* or *semantic* sense in which a sentence represents the state of affairs it describes, or

> with the *iconic* sense in which a picture represents what it depicts. (Bennett & Hacker, 2003, p. 142).

Given the associations that the term 'representation' (and, I would include here 'map' and 'image') are prone to, Bennett and Hacker (2003) pronounce a death sentence over its continued utilisation: 'The term 'representation' is a weed in the neuroscientific garden, not a tool – and the sooner it is uprooted the better' (p. 143)[21]. I now turn to a brief consideration of other related metaphors used in the text.

Spatial-geographic and ocular metaphors abound in Damasio's text. The former, for example, are indicated by the mind being described as a 'province', a 'landscape' and a 'theatre', the body as a 'landscape', a 'playing field' and a 'theatre', emotions seen as objects which may 'intrude', the subcortical as 'subterranean', pain and pleasure as 'landscapes', images as occurring 'in' the mind (p. 105). Ocularcentrism, here implying the dominant utilisation of metaphors associated with vision and the act of looking, is equally ubiquitous in the text (as they are in contemporary science where understanding is defined as sight (Lakoff & Johnson, 1999)); we are offered a 'window' to, or a 'glimpse' or 'view' of the body, a 'light' is thrown on the body landscape, brain structure may be described in 'microscopic' detail, mind and thought are comprised of 'images', a term even used when speaking of other senses such as the auditory and somatosensory. The utilisation of such terms instantly creates an outside, a place to view things from. It also disrupts Damasio's indissociable organism by seemingly locating us in a Cartesian elsewhere where we can glimpse the body.

Other metaphors used by Damasio at points in the text, such as literary terms including 'narrative', 'account', 'screenplay', 'phrase', and 'story', which again imply an outsider who listens in, attends from a place outside the ceaseless change that Damasio so clearly indicates cannot be escaped, that there is no place of stillness. For example, when the insular and parietal cortices 'receive an account of what is happening in the body' (p. 144)

[21] Bennett and Hacker (2003) are not alone in their concern; Cilliers (1998) and Harré (2002) also critique the use of the term in cognitive science and neuroscience.

it again implies an other to which this must be told or, more interestingly, locates these cortices as outside of the body, troubling the indissociability of Damasio's organism. These are not others as implied by these metaphors but body structures intimately connecting, resonating, and responding, in the process allowing the course of life.

To summarise: Whatever happens in the brain in response to perturbations in the rest of the body or in the surrounding environment is described in the text as 'images', 'maps', 'representations', or 'perceptions'. These set up a tension in the text in that they create an outside; they posit some place beyond from which the viewing can be done. Terms such as 'image', 'representation' or 'map' imply three things: i) something that is viewed (and since it is termed as 'viewing', an ocularcentrism), ii) a viewer (a homunculus), and iii) a position outside of the activity from which the viewing is to be done. The question is then whether it is useful to refer to neural activity patterns in the brain by such metaphors? The consequence is that Damasio's ostracised homunculus is implicitly reintroduced or, rather, he may be gone in name but his chamber remains where, should a new occupant arrive (which seems necessary given such metaphors), the maps, landscape, images, and representations, may be viewed.

This critique is not meant as an argument for a return to the positivist daydream of a non-metaphoric language, one which accurately, directly and unproblematically *represents* that of which it speaks[22]. One can critique the consequences of the use of a set of metaphors without implying that some ideal (pictorial) language game (or reading) is possible. Furthermore, within this text where the notion of a homunculus and a stable exterior is so explicitly critiqued (and where a clear line between an interior and exterior is sullied), the continued use of such a set of metaphors clearly signals something contradictory. In such ocular metaphors a metaphysical daydream is still active, where a position beyond the physical, the ceaseless change of materiality, is retained as much as it is explicitly discredited. The question it raises is how do we make sense of this presence of presence? I will address this question shortly.

[22] This is possibly an inevitable situation given the gaze of cotemporary neuroscience and its emphasis on objective observation. This is a gaze that Damasio, at points in the text, explicitly works hard to appease, since losing one's scientific affiliation or credibility seems rather easy.

Distancing this metaphysical 'remnant' allows for the celebration of the play of difference, the textuality of the embedded organism. The setting aside of ocular and narrative metaphors brings to the fore the corporeal dynamics articulated in Damasio's account. If these particular notions or frames are not brought to bear on his description of a ceaselessly changing body, comprised in part of a endlessly reiterating brain where sets of spatially separated neural activity stand in continuous juxtaposition to each other, then what is revealed bears resemblance to a Derridean logic of *différance*, where the play of difference across time and space is primary. This stands in contrast to the metaphysical economy; the imposition of the presence of maps and images, and their implicitly implied viewers and viewing towers.

THE IMPOSSIBLE NECESSITY OF INTIMACY

At this point I would like to suggest that this implicit return to the metaphysical is more than just a discursive remnant of a disembodied cognitive science, an erroneous and extraneous extra that simply needs to be erased from Damasio's text in order for its true radicality to shine through. Rather this presence of presence speaks of the impossibility of escaping an economy, the unavoidable imposition of order on a landscape that both accommodates and undoes its convolutions. If we are to meaningfully engage with the world, if there is to be meaning, even if we are to be, then an economy is required. This does not imply a final foundation, the truth, but the need for a foundation and truth, one that is unavoidably violent and limited, and one that will always be undone, changed, and re-placed, but one that none-the-less endures and enables, that is, one that brings about an identity. I will ground this claim through two points; first, the impossibility of escaping the metaphysical, and, second, the aporetic nature of (accounting for) the body-subject.

To celebrate the aneconomic, a general logic of differences; is to celebrate ceaseless change and movement, continuous reiteration and juxtaposition. There is no outside here but only incessant modification where a myriad of activities stand in relations of difference to each other across time and space. The problem here is with the generic belief of being able to

transcend the violence of oppositional logic or dialectical (Hegelian) thinking (the dynamics of opposites) (Kirby, 1993). It assumes, firstly, that this logic should be understood as an error and, secondly, that it therefore can be avoided or corrected. This is unpacked by Hurst (2004) in relation to Rorty's reading of deconstruction[23] where a binary is re-evoked (that of literature/philosophy) in order to posit a post-binary nirvana (where binaries are replaced by the play of pure difference). This belief actually sets up a new binary (difference/distinction). It is an essentialising logic in that it supposes that there is a place that can be reached where violence can be transcended, there is a code (an essence) that can be excavated (articulated) that delivers us from this burden, we can be uncontaminated, we can become beautiful souls. This is the Hegelian idea of *Aufhebung* – negation and transcendence – and is thus a return to the very violence of dialectical thinking from which it is hoped to escape. The belief is itself is a dialectical idea.

If the *radical (indissociable) intimacy* that Damasio describes is to be taken seriously then how are all the moments in his text that differentiate between body and mind, brain and body, organism and environment, to be understood? Is this not contradictory? It would seem that if we are to treat the radicality of this intimacy with sincerity, that is, as a level of integration where, as Damasio points out, the term 'indissociable' is an oversimplification, then these distinctions are acts of violence against this indissociability. How is it possible to impose such binaries, to draw any bold lines for that matter, in a landscape marked only by temporal and spatial reiteration and juxtaposition? In such a radical landscape is the very possibility of distinction not lost? Does the term 'intimacy' not loose its meaning, its utility, when there is no other to be intimate with? In this radicality, this ceaseless play of aneconomic activity, even the notion of difference seems paradoxically lost. On the other hand, the imposition of distinctions between brain and body, body and mind, body and environment, introduces a separation, a distance, where the problem of the nature and possibility of this relationship again emerges and intimacy is again lost. Thus we are trapped between disappearance into the other and the illusionary purity of the binary (form/other). Intimacy is thus impossible since it is lost both in the aneconomic play of difference and in the economy of distinctions. Furthermore, unless we are willing to

[23] See Chapter 4.

forsake the scientific project as that which gives an account (an economy) that is accurate (one that faces up to the impossibility of circumscribing the impossible), we cannot forsake intimacy. It would, more than this, be an attempt to escape the project of life itself. Therefore intimacy emerges as that which sits undecidably, irresolvably, and irreducibly between the enabling dissolution of the aneconomic and the enabling distortion of the economic; in the play of dissolution and separation.

Derrida's secondary violence remains; the Law to be imposed on the aneconomic (the primary violence of *différance*) so as to bring an order to that which continuously slips away and is in excess of such endeavours; an attempt to frame that marked by ceaseless change (Beardsworth, 1996; Hurst, 2004). The reading described in the previous section may then be regarded as a violence of the third kind, a deconstruction of this economic imposition, a sweeping aside of a particular metaphysical discourse utilised by Damasio to articulate corporeality. Crucially however, this does not imply an escape from the necessity of the economic. Bennington (2000) points out that '[o]ne of the challenges of Derrida's thought has always been to grasp together singularity and plurality or multiplicity' (p. 75). To think the economic and aneconomic simultaneously is what Derrida (1982) calls 'the very enigma of *différance*', 'the point of greatest obscurity', in that these aspects 'cannot be thought *together*' (p. 19, emphases in original). The attempt to think the singularity of the body-subject in the context of a decentred multiplicity is Damasio's challenge. The singularity that returns when we acknowledge this necessity is not that of a radical metaphysical transcendence as we find with Descartes but of one that emerges, a dynamic and violent economy, from the materiality of traces.

TROUBLING THE FUNCTIONS

In this final section I (mis)read a number of notions distinguished in Damasio's text, these being; perception and recollection, universal and derivative feelings, activity and structure, innate mechanisms and social strategies, and pain and suffering. These expand on the complexity of the notion of a dynamic spatial-temporal intimacy articulated above.

In distinguishing *perception* from *recollection*, Damasio refers to the latter as 'momentary reconstructions, attempts at replication of patterns that were once experienced' (p. 101), as 'approximations' (p. 100) that are 'newly reconstructed of the original' (p. 100). Thus a binary (original/replication) relationship is set up between the original experience (perception) and the recollection of that experience (memory). This neat distinction does however become difficult to retain should one consider that this original perception that Damasio describes is invaded by the past, that perception itself is always already a recollection. Whether this is in terms of innate dispositional representations (so called trans-individual potentials for neural activity that may even exceed the species) or acquired dispositional representations (which were acquired within the experiential history of the individual organism), both types are reactivated during the course of a perception. So no perception can occur on a whole new (ahistorical) neurologically fresh terrain; as Damasio indicates; 'neither our brains nor our minds' are 'tabulae rasae' (p. 111). Both cases infer a repetition, a 'recollection', an invasion from the past (individually or species-based) when a 'perception' as such occurs. Furthermore, with regard to memory, since such reconstructions are approximations, the process of recollection is never, as Damasio admits, an 'exact reproduction' but an 'interpretation' (p. 100), implying the presence of difference, of newness, in the moment that the past is regenerated. Thus a clear distinction between perception (the present) and recollection (the past) is problematic as, in both cases, one finds the other always already at hand.

A dispositional representation (DR) is described as 'dormant firing potentiality' which 'comes to life' when activated (p. 103). It is thus an absent presence when lying inactive and a present absence when active. It is an absent presence in that in its dormancy or potentiality a structural network or pattern lies in wait, given a history of 'strengthening and weakening of synapses' (p. 104)[24], a past lies in wait to both resonate with the present circumstance (such as in the 'perception' of an object in the environment) and to constitute the experience of that presence (since the object reactivates neural patterns). It is a present absence since in its reactivation it is not the DR which is experienced but rather a pattern of primary cortical or sensory area ('topographically organised representations' (p. 106))

[24] See discussion of connectionism in Chapter 8.

activations which the DR activity reconstitutes. In binary discourse we have here an illustration of the intimacy of *activity* and *structure*: Activity (the firing and synaptic communication of ensembles of neurons) enables the setting up of neural structure (constituted by varying strengths across neuron synapses), a structure that 'remembers' in the absence of activity but lies invisible until revealed by reactivation (and then never in pure form – a return to the 'original' - since the repetition brings with it structural change – a 'continuous modification' (p. 404)). Structure enables activity, since the brute materiality of neurons, molecules, and atoms is essential for activity and through its tendency to sediment ('remember') previous activity it enables the approximation of previous patterns.

In his discussion of *varieties of feelings*, Damasio differentiates between two types: The first is based on emotions, which 'correspond to profiles of body state response which are largely preorganised' (p. 149). When the body conforms to one of these profiles we then feel the 'most universal' of feelings (i.e., Happiness, Sadness, Anger, Fear, and Disgust). The second variety are defined as 'tuned by experience' and are 'subtle variations of the five [feelings] mentioned above'. Thus, for example, wistfulness is regarded as a variation of sadness. This distinction between innate (pure) and modified (secondary) feelings raises a number of questions: When do we know that we are experiencing a pure or modified feeling? Or stated another way, how do we recognise an acultural moment of feeling? Can, for example, Anger be conceived outside of the cultural discourses and embodied practices that inform such performances and experiences? Can one tap into emotions and feelings that are prior to individual experience? When experiencing Anger do we then in that moment step outside of our personal experiences and cultural embeddedness and return to some primal (ahistorical) species state?[25] Instead of speaking of feelings that are the essence and those that are variations, is it perhaps not less problematic to speak of those marked as essential are themselves being but further examples of the variation of body states (emotion).

[25] As made clear below, these questions may also be asked of other 'primary' phenomena; such as instinctual behaviour and the experience of pain.

Perhaps Damasio acknowledges the messiness of this distinction when he indicates that pure feelings 'are *largely* preorganised' (p. 149, emphasis added). Even the term 'preorganised' may be troubled by being read as 'prior to' or 'before' being ordered, suggesting a 'foundational' aneconomic state which is then ordered within experiential/ cultural/historical process. An example here is Damasio's discussion of the evolution[26] of the senses in organisms where 'simple organisms' were marked by a 'whole body sensitivity' (the general) which then evolved into vision located in the specialised organ of the eye (the particular). This may be read as the development of an amorphous sense (an aneconomic space) becoming localised or ordered into a sense organ (an economic imposition). This would, of course, be an ordering continuously marked by difference across time and space. As is typical of such attempted distinctions between essences and variations (or pure and distorted versions, or readings and misreadings), those marked as special or core are usually themselves examples of variations (usually entrenched as primary through institutional processes). I next turn to a discussion of instincts and drives as used in the text.

Damasio's characterisation of instincts and drives are multiple and confusing[27]: At times they are a mysterious elsewhere or outside 'controlling' our body or represented 'by' neural circuits, at moments a 'slightly more complex regulatory mechanism' (p. 116) that involves the entire body, later the 'government' of the brain by the body (p. 116), at other instances more specifically an 'innate neural pattern' (p. 115). The distinction between instincts and drives are similarly unclear; 'drive' being either the effect of instincts where the latter 'drive you to perform (or not) in a particular way' (p. 116) or something more distinct; a body state (and thus a synonym for emotion) caused by an instinct and experienced as a feeling (e.g., fear) or need (e.g., hunger) encouraging particular behaviours. What is clear is that these terms refer to something innate that either directly 'causes' overt behaviours or indirectly 'causes' behaviour through physiological states. They are triggered by a

[26] As will also become clear, 'evolution' provides a useful conceptual lever for deconstructing a number of hierarchical binaries.

[27] In general the concept of instinct is far from unitary and is used in a myriad of confusing ways (Bateson, 2000).

physiological need, external stimulus, or thought and their primary 'aim' (if one can speak of instincts and drives as having intention) is the continued survival of the organism.

Instinctual control is not complete; as Damasio points out, instincts and drives are coercive influences that we can learn to avoid in certain circumstances. These are thus, to use one definition from the above list, 'innate neural patterns' that are inflexible but controllable – a hard sedimented core, a trans-individual constraint, impenetrable, where direct intervention would result in the destruction of the organism. Humans thus:

> rely on highly evolved genetically based biological mechanisms, as well as on suprainstinctual survival strategies that have developed in society, are transmitted by culture, and require, for their application, consciousness, reasoned deliberation, and willpower (p. 123).

A distinction is thus drawn between *innate mechanisms* and *social strategies*. For Damasio this does not require Cartesian metaphysics but a consideration of the 'neurobiology supporting adaptive supraregulations'; circuits that support behaviours 'generated in collectives of individuals' (p. 124). These conventions and rules are said to be:

> additional layers of control [that] *shape* instinctual behaviour so that it can be *adapted* flexibly to a complex and rapidly changing environment and ensure survival for the individual and others… in circumstances in which a preset response from the *natural repertoire* would be immediately or eventually counterproductive (p. 124, emphases added).

In the above the innate is conflated with the natural placing the social outside of the biological despite claims of the latter occupying a neurological materiality; the neural representation of such 'wisdom' being 'inextricable linked to the neural representations of innate regulatory biological processes'; a trail 'made up of connections amongst neurons' (p. 125). Aside from being a contradiction, the above is problematic given that instincts and drives emerge through a process of evolution (a core theoretical notion drawn on

repeatedly throughout the text), this implying that these would have emerged through an intimate relationship with the environment. But, one may ask, when exactly did the evolutionary relationship between organism and environment take on social dimensions? Quite soon it would seem given that Damasio refers to the 'social observances' and 'social organisation' of monkeys and birds (p. 123). Can one conceive of biology or, more specifically, of instincts (since so many basic social behaviours are attributed to instincts) that precede such a social? Isn't it easier to assert that the social lies at the heart of the formation of instincts and drives? The distinction between the instinctual and the social where the former is conceived as natural is thus troubled. It seeks to establish a pre-social realm where certain behaviours are naturalised, even though they are social in nature. Since it implies the existence of primary behaviours it raises the same questions as claims to the existence of primary feelings: How do we know which is which? When Damasio points out that social strategies are 'interwoven' with the 'instinctual repertoire' does this not make the identification of primary behaviours difficult and their identification as 'primary' ideological? Are instincts not better conceived of as well sedimented examples of social strategies?[28]

Finally, in a discussion in the 'Postscriptum', Damasio argues that pain and pleasure consist of two components, here referred to as *local and general pain and pleasure*. For convenience, and following on from Damasio's own emphasis, I will here focus primarily on pain, where pain and suffering are synonyms for these local and general aspects. Local pain is regarded as a form of 'local body-state change' and is a 'somatosensory perception in the proper sense' (p. 263). Local pain and pleasure are 'levers' required for instinctual and acquired strategies to operate efficiently and for the development of social decision making strategies (p. 262). They are 'brain activity patterns' which 'are set *a priori* in the brain structure', 'instructed genetically' they are 'a prime example of mental phenomena that depend on the activation of innate dispositions' (p. 262). As such local pain and pleasure are conceived of as pure phenomena, in themselves acontextual, acultural and asocial; once triggered they are universal and pure. Suffering in contrast refers to a 'more

[28] This has Lamarckian overtones, an influence not wholly absent, contrary to mainstream evolutionary readings, from Darwin's own theorising (Wilson, 2004).

general change in body state, in fact an emotion', 'a particular body landscape' (p. 263). Here we also find flexibility, since the perception of this landscape can be modified by neurotransmitters and neuromodulators, ameliorated through cultural practice and education.

Local pain is described as a '*transient* representation', an '*innocent* processing of body change', whilst the change in body landscape that *ensues* allows for the 'unpleasant feeling of suffering' (p. 263, emphases added). The former is an '*essential* device' whose threshold and intensity may be modified by 'culture and individual history' (p. 264, emphasis added). Suffering is an '*additional* state of annoyance', an addendum to the 'pain image' (p. 261, emphasis added). This secondary supplementary role of suffering to the essential pain image is however undermined by Damasio himself since it is suffering, that which 'puts us on notice', that plays an important role in survival. Suffering is that which is amended by context (culture, education). But there is also another point where the primary status of the pain image is undermined: Local pain is transient; it is an innocent moment in the present with no past or future. Again, here taking the notion of evolution seriously as in the previous discussion on instinct, this begs the question of if it is so transient, so unmemorable, then how did such circuitry become sedimented in the first place? As the transient, the instantly forgotten, what motivational force is left to it? This implies that the supplement, that of suffering, that which belongs to the body in general is an essential aspect, since, as that which lingers, it provides the condition that not only allows survival but as that which has allowed local pain to be established (encoded, sedimented) in the first place. In this sense the distinction is disrupted, suffering as that which is open to social, cultural and contextual amendment, here precedes the 'essence' of the pain image. Biology in its most acontextual moment, that of the pure sensation of pain, is preceded, both in evolution and individual circumstance, by contextually embedded suffering.

The above section has detailed a number of (mis)readings of perception and recollection, activity and structure, universal and derivative feelings, instincts and social strategies, and local and general pain and pleasure. These analyses trouble attempts to draw bold

distinctions between past and present events, activity and structure and attempts to establish primary categories in terms of feelings, behaviours and sensations. Experience is only possible due to past sedimentations and the past is forever renewed when recollected, never naively re-accessible; structure (materiality) enables activity and activity (process) instantiates and amends structure; and context is a disruptive presence in attempts to make universal claims. In this sense the body in Damasio's neuroscience does not allow for an opening where context, which includes the socio-cultural and thus the play of the relations of power, can be excluded from conceptualisation.

SYNOPSIS

Descartes' error disrupts several traditional binaries in the neurosciences commonly used to understand the relationship between the cortex and subcortex, body and brain, and organism and environment. Damasio argues that emotion cannot be divorced from reason, and that reason cannot be equated with the cortical (the plastic and experiential) and separated from the subcortical (the stable and innate). Furthermore, in order to understand the phenomena of mind, the profound intimacy (indissociability) between the mind, brain, body and environment cannot be ignored. The intimate relationship between these aspects is sketched across the length of the text. Corporeality is depicted as an active materiality where complex phenomena are possible as a result of the intimate and synchronous interaction between multiple anatomical and environmental components distributed across space and time. Through continuous reiteration across time, and spatial and temporal juxtaposition between activities in multiple distributed sites, difference and stability are instantiated from one moment to the next and between one set of activities and another, allowing an indissociable intimacy between corporeality and the environment. The mind, brain and body are therefore profoundly entwined.

The body is a ceaselessly changing mass, whose state the nervous system endlessly 'represents' ever anew from one moment to the next. This representational discourse is critiqued ultimately being identified as metaphysical and reinserting a Cartesian dimension in a text where points of externality and stability are ostracised. It is argued that this

presence of presence remains as a necessity in a context where the radicality of Damasio's play of juxtaposition makes the possibility of distinction impossible. Although a discourse of representation is problematic and undermines Damasio's explicit anti-Cartesian agenda, it signals the impossibility of transcending the need for an economy. The parameters of the body-subject then emerge out of the play of dissolution and separation, the enigma of the aneconomic and economic, the two aspects of intimacy that enable being-in-the-world and being (identity) itself.

The deconstruction of distinctions between perception and recollection, activity and structure, universal and derivative feelings, instincts and social strategies, and local and general pain and pleasure, trouble attempts to draw bold distinctions between the past and present, activity and structure, and efforts to establish primary (pre-social and universal) feelings, behaviours and sensations. These analyses again reveal a corporeality that is profoundly embedded contextually and historically: Perception is only possible due to past sedimentations and in recollection the past is always an approximation and is thus in some sense always new. Active materiality is demonstrated by showing how structure enables activity and activity instantiates and amends structure. Context and the social are always already to be found in claims of universality.

CHAPTER 6
GOLDBERG'S PARADOX

INTRODUCTION

In closing his foreword to Elkhonon Goldberg's *The executive brain: Frontal lobes and the civilised mind* (2001), Oliver Sacks, places this text amongst 'a handful, a small handful, of remarkable books' that address 'how nature and culture interact, and how brain and mind produce each other' (p. xiv). Amongst this 'select' few he also places the work of Antonio Damasio (p. xiv). Thus Damasio and Goldberg both hold places of significant status in a particular area of the neurosciences, at least by the reckoning of one of its doyens.

Goldberg's credentials in terms of his institutional affiliations, intellectual lineage, and academic productivity are impressive. In terms of professional affiliations he is indicated as Clinical Professor of Neurology at the New York University School of Medicine, Lecturer at the Department of Psychiatry at Columbia University, Adjunct Professor at the Department of Psychiatry of the Mount Sinai School of Medicine, and Director of the Institute of Neuropsychology and Cognitive Performance (Goldberg, n.d., 2001). In 1987 he was awarded Diplomate status at the American Board of Professional Psychology and the American Board of Clinical Neuropsychology. He studied neuropsychology directly under Alexandr Luria, a prominent figure in the early development of neuropsychology, at the Moscow State University, which Goldberg (2001, p. 14) describes as the 'Harvard of the East', one of the then Soviet Union's (USSR) 'elite universities'. Goldberg moved to the United States of America (US) in 1974 (a difficult exercise which he describes in detail in the book), where he still works as a neuropsychologist and cognitive neuroscientist (Nationmaster, n.d.). He has published three books and copious articles, as well as serving on the editorial boards of several prestigious journals.

Given the above, we are thus again dealing with a respected member in the field of the neurosciences who has produced a valued text. Here is a person who, to use Bourdieu's notion, possesses professional and academic capital. The aim then in this chapter, as with the other two that comprise this part, is to provide an account of a deconstructive reading of

a text, in this case Goldberg's *The executive brain*. This chapter is structured into two broad parts: In the first, the general structure, style, aim, scope and claims made in the book are considered, whilst in the second, a deconstructive reading of several themes dominant in the text is provided. The chapter then closes with a synopsis.

A BETWIXT TEXT BY A BETWIXT PROPER NAME

Goldberg admits early on that he is 'writing this book, in a language not entirely [his] own, with hesitation'[1] (p. xv). He is referring here not to the fact that he is writing in English, which is not his mother tongue, but that his intention was to write 'a semi-popular book' (p. xv), aimed at a 'general audience' (p. 1), and that he therefore needed 'to reach beyond the format of narrowly circulated scientific journals' (p. xv). However, he admits that halfway through this goal was abandoned[2] as the 'professional in me prevailed over the popularizer', resulting in a book that he labels a 'hybrid' (p. 1). Consequently, the chapters vary in degrees of 'technicality', the presence of formal neuroscientific discourse[3] fluctuating, with some chapters identified as being more 'accessible' than others (p. 1).

But there is another way in which the book is a betwixt text, a 'both/and' manuscript: Sacks, in his Foreword, refers to it as an 'intellectual autobiography', an 'intellectual and personal' journey, that achieves a level of intimacy by using 'case histories', 'neuropsychological anecdotes', and 'personal narratives of every sort' to form its 'narrative heart' (p. viii). For Sacks this departure from the tradition of concise and impersonal scientific discourse is an asset in that it makes the book 'a highly engaging and intimate memoir' that still provides a 'brilliant exposition of the complex functions of the frontal lobes'; it emerges as a 'grand piece of scientific reporting' that is still '"popular" science' (p. viii).

[1] Although this is obviously not what Goldberg means here, we could agree, given a linguistic system marked by the play of *différance*, that we all have to operate within a symbolic order that is never fully our own.

[2] Which, I suppose, following the logic of the text, we could describe as a failure of Goldberg's frontal lobe functioning.

[3] In contrast, a far more dense, technical and esoteric prose may be witnessed in Goldberg's 1990 publication aimed at neuropsychologists; *Higher cortical functions in humans: The gradiental approach*.

In a sense, Goldberg's 'failure' to provide a pure type of discourse reflects his own assertion that the world we live in is marked by ambiguity (p. 78) and complexity (p. 3), one where accounts 'cannot be reduced to simple, coherent and universally valid discourses' (Cilliers, 1998, p. 130). Here then numerous narratives are possible, not in an 'anything goes' or 'anything is possible' sense[4], but where such a multiplicity still works in a contingent and provisional manner within the constraints of the system within which the telling occurs. Here then the co-presence of the personal and professional are a 'victory' in that its supports his claim about the world we exist in and through.

Goldberg makes it clear that he himself occupies a position between places, that he is a betwixt person and a betwixt professional. He describes his own intellectual and cultural development as a merging of US and USSR influences; 'I am a man of the East in the Western cultural cloth, so to speak.' (p. 227). Goldberg's prominent Soviet influence is the well known, influential and respected neuropsychologist, Alexandr Romanovich Luria, a man to whom the book is dedicated and whom Goldberg describes as 'my professor, my mentor, my friend, and my tyrant' (p. 4). This relationship and its complexities is the focus of the second chapter of the text, where Goldberg discusses his point of transition from Soviet citizen to 'nomad' (p. 227), a period in the early 1970s where he admits that his own executive abilities were tested to the extreme as he took on the Soviet bureaucracy so as to escape to the West.

Just as the book opens with a discussion about Russia, Goldberg also closes with this topic. In the Epilogue he states that when the book is completed he plans a trip to Moscow and that when this is over: 'I will return home to New York, but hopefully with the feeling that what used to be my home is no longer a strange place' (p. 228)[5]. I refer to these personal instances not only to make explicit a theme of betwixt-ness (in terms of narrative, cultural

[4] See Chapter 4.

[5] Within a post-structural framework such statements beg questions: Is a book ever finally written, that is, is its interpretation ever finally fixed? Does one ever return home? Does one ever return to the same place; to complete familiarity, to a complete lack of strangeness? It is really Heraclitus' question about whether we can one ever step in the same river twice?

practice, intellectual influence, and, as we will see, conceptualisation) that runs through Goldberg's text but also to start making the point that there are several instances where Goldberg's statements would most likely ruffle the feathers of a critical psychologist.

Goldberg's complete revulsion of the Soviet system is made overt on several occasions as he writes of its oppressive effects on his society (referring here to the state's programme of '"sociocide"'(p. 12)), his family (e.g., his father's imprisonment in Stalin's Gulag), his mentor (resulting in Luria being in, what Goldberg calls, a state of '"autohypnosis"' (p. 16)), his ethnicity (referring to the state's 'tacit anti-Semitism' (p. 11)), and his career (where becoming part of the intellectual elite effectively imprisoned one in the USSR). This stance is thus well justified but, for a man whom Sacks describes as a 'rebel at heart' (p. viii), it is accompanied by a surprising lack of criticality in terms of US politics and cultural practice. For example, he displays no critical distance in terms of the then emergence of neo-liberalism[6], an ideology which he both celebrates and naturalises. For example, the emergence of geographical 'microunits', in both the East and West, 'based on strictly economic factors and interrelated through the flows of trade, finance, and communications' is regarded as part of 'the same natural process' (p. 221). The neo-liberal order is thus represented as a more advanced and sophisticated social system, the result of a paradigm shift that is posed as both natural and evolutionary.

Aside from the above there are moments when Goldberg draws on his Russian history and position as a senior professional to engage in some puzzling rhetoric. I will spend some time and space unpacking two such moments in order to demonstrate the ethical challenge of reading Goldberg as well as the rhetorical utility of writing a betwixt text, where personal anecdote can substitute for conceptual argument. In a section where he explores

[6] It should be noted that the text was written before the events associated with 9/11 and the neo-liberal policy related economic meltdown of late 2008. 'Neo-liberalism' refers to an ethics of self, a critique of political practice and structure, and a vision for social transformation (Rose, 2008). Its emphasis is on the maximization of individual 'freedom' (with a consequent maximization of social inequality) and the development of the enterprising self who must demonstrate ambition, initiative and responsibility - the hyper-exploitable and exploiting cultural dope. Hence the minimization and decentralization of the state is encouraged (with an ironic strong return of the state in terms of control and policing) so as to allow space for the 'natural' dynamics of the market (Hardt & Negri, 2000).

what he calls 'male and female cognitive styles' (p. 88) and 'cognitive gender differences' (p. 93)[7], Goldberg writes that he is 'sometimes assaulted when a statement of gender *difference* is militantly misconstrued as a statement of gender *inferiority*' (p. 93, emphases in original). The point that difference does not necessarily imply inferiority, that is, that we are dealing here with a binary opposition (masculine/feminine) that is not *necessarily*, in itself, hierarchical is a point also made in the feminist literature (e.g., Gatens, 1991). However, rather than developing this important point, Goldberg resorts here to a personal anecdote where he refers to being the 'target of misguided political correctness' (p. 93):

> A young postdoctoral fellow interrupted my presentation and stridently accused me of male chauvinism as I was presenting the findings described in this chapter. I responded by saying that not having been particularly concerned about political correctness in my country, the Soviet Union, where the consequences of political 'incorrectness' could be quite dire, I saw no reason to worry about it in the United States, where the worst that could happen was wasting my time on a stupid argument. To their credit, the audience of doctors and medical students reacted with a round of applause. (p. 93)

The 'postdoctoral fellow' is characterised as 'young' (this could be read as being naïve, possibly ignorant, and of lower rank), a person who 'interrupted' (acted in a socially inappropriate manner toward) Goldberg and 'stridently' (that is, rudely) accused him of 'male chauvinism' (an overtly frowned upon practice). This is followed by a convenient distinction (since it is in the context of a US institution) between the Soviet Union ('my country' - possibly referring to his own history of oppression) and the United States, the former aligned with oppression and punishment, whilst the latter with freedom and (ironically, given Goldberg's response) tolerance. The argument being termed 'stupid' implies that the postdoctoral fellow (whose sex is conveniently not indicated) is not a threat and is intellectually lacking. Thus the situation is not a challenge either intellectually or

[7] The terms 'male' and 'female' are typically used to refer to 'sex' rather than 'gender', where the terms 'masculine' and feminine' are utilised (Gatens, 1991), representing a biological/social binary. Goldberg's use and conceptualisation of these terms will be explored later in this chapter. Also see Chapter 3 for a discussion of the sex/gender binary debate.

politically. Goldberg positions himself as a rebel, generally contemptuous of 'political correctness', and focussed on science and the truth (his 'findings'). Through their 'round of applause', the 'audience' is positioned as in support of Goldberg. This approval is not only by 'doctors' but also 'medical students', that is, those junior to the postdoctoral fellow. The public humiliation described here is thus comprehensive. This account leaves several questions: Why mention this incident at all? Why not instead develop the interesting difference/inferiority argument mentioned earlier? Why resort to a vignette that makes Goldberg, at least to me, sound like an arrogant thug?

I will refer to one more instance prior to closing this point and finally moving on to describe the main aim of the book, its scope and basic findings. In one section, 'Executive talents: The S factor and the theory of mind' (pp. 104-112), Goldberg develops a distinction between an 'S-factor' and 'D-factor'. Being 'smart' is described as 'a global, central, defining personal attribute' (p. 105) that has ontological status ('the S factor does exist') which, moreover, enjoys the 'tacit support of scores of ordinary people…' (p. 106). He then moves on to define the notion indicating that to 'a large extent, the trait in question refers to our ability to form the insight into other people and to anticipate their behaviour, motives, and intentions'. More specifically it is the ability to 'form an internal representation of the other person's mental life'; what Goldberg calls the ability to form 'the "theory of mind" of the other person' (p. 107). This is then contrasted with a 'D factor (D for "dumb")', which he admits is a 'highly inflammatory enterprise… in our correctness-preoccupied culture' (p. 107), but, none the less, '[b]eing "smart" (or "dumb") is not an attribute of you; it *is* you' (p. 104, emphasis in original).

To then illustrate the point that the presence of the D factor is not an indication of frontal lobe pathology but a normal aspect of a proportion of the population, Goldberg provides an vignette of a patient who came to see him and, upon being asked, provided a highly detailed account of a car accident he had been involved in. Having provided details that, in Goldberg's opinion, were of 'no relevance whatsoever' (p. 109), he concludes that '[m]y good patient failed to form an accurate theory of my mind…' and that 'the odds are that he has always been like that: a bit, well… "dumb"' (p. 109). Here we may ask whether the

above is evidence of a 'D factor' or could it be understood as an instance of a person that had misread the context and the expectations of such a specialised context, possibly due to a lack of experience of such situations. Or it could be read as the demonstration of a particular cultural practice, possibly class related. It might be argued that it was Goldberg who has failed to form a particular theory of mind (or culture) of the patient. It suggests that a particular relation of power is at work here where the person with more status (the doctor) has the right to not have his time taken up – rather than the doctor (as healer) accommodating and demonstrating empathy to his patient.

The above should *not* be read, on the one hand, as me engaging in *ad hominem* arguments, or, on the other hand, as providing grounds for discarding this particular text and moving on to one less provocative. Rather it illustrates the point that Goldberg's language is 'not entirely [his] own', that his intention and argument has to operate within the *différance* of writing, where the possibility of being called (justifiably or not) an 'arrogant thug' exists. This encourages me to continue with a deconstructive reading not despite such occurrences but *because of* such instances since other claims and notions in this text may open themselves up in more useful ways (in terms of the objectives of this project).

THE EXECUTIVE BRAIN: AIM, SCOPE AND CLAIMS

Goldberg notes in his introductory chapter that the brain enjoys a great deal of current popular interest which has resulted in a plethora of books on the subject which focus on every imaginable aspect of brain functioning. There is however one exception; 'one part of the brain has been completely ignored in this genre: the frontal lobes' (p. 5). Thus: 'This book has been written to fill this gap' (p. 5); to give voice to what 'early theories' called '"the silent lobes"' (p. 24).

In what Sacks calls a 'brilliant exposition', Goldberg spells out the 'complex functions of the frontal lobes', the differing 'frontal lobe "styles" in normal people', 'the tragic mishaps' following damage to and disease of these structures, the 'ways in which their function can be tested', and the 'ways in which frontal lobe function can be strengthened' (p. viii). But

Goldberg's ambition is broader than this; following a repetitive definitional motif he indicates that 'This book is about': 'leadership'; 'motivation, drive, and vision'; 'self-awareness and awareness of others'; 'talent and success'; 'creativity'; 'men and women'; 'society and history'; 'social maturity and social responsibility'; 'development and learning'; 'aging'; 'neurological and psychiatric illness', 'enhancing your cognitive functions and protecting your mind against decline'; the '*brain*'; and, finally, '*people*: about my patients, my friends, and my teachers' (pp. 2-4, emphases in original). Despite (and due to) this broad scope, Goldberg makes it clear that this is 'no attempt to be dispassionately encyclopaedic', but rather to provide a 'distinctly personal, original, and at times provocative viewpoint'; and that, although many of these points have been published in scientific journals, they 'do not necessarily represent the prevailing opinion in the field' but are 'partisan, controversial, my own' (p. 4). The journey thus promises to be interesting and rich.

Compared to Damasio's text, *Descartes' error* (1994), discussed in the previous chapter, which follows a fairly clear trajectory in order to demonstrate a proposed link between the body, the frontal lobes, reason, and emotion, Goldberg's text is a more sprawling affair. He is here demonstrating a diversity of linkages as he attempts to justify a particular characterisation of a large structure in the brain. As a 'student of the executive functions' (p. 7), the conclusions expressed are the outcome of various research projects and a long career shaped by a deep interest in the frontal lobes. I will briefly list the main claims of the book here:

The anterior cortical structures of the brain, the frontal lobes, are vital for goal oriented action, and, as such, need to be understood functionally (and metaphorically) as the 'conductor' of the brain (p. 37). The functions associated with these frontal lobes, called the 'executive functions' (p. 2), also then, necessarily, liberate the organism from predetermined responses, resulting in a proactive rather than reactive body. Furthermore, the development of these structures was essential for 'creating and holding images of the future', which Goldberg regards as a 'necessary prerequisite for tool making, and thus the

ascent of man (sic) and the launching of human civilisation' (p. 25). Included here is the emergence of the instrumental utilisation of language.

Goldberg describes the co-presence of two dissimilar but complementary forms of neural organisation represented in the cortex and subcortical structures respectively, where the former follows the more evolutionary recent gradiental principle and the latter the modular principle. The former is regarded as having resulted in 'an exponential surge in the computational power of the brain, which culminated in a conscious mind' (p. 222). This increased complexity resulting from a gradiental form of cortical organisation allows for a remarkable degree of 'freedom' in cortical functioning. This however produces what Goldberg refers to as the 'leadership paradox' (p. 215): '[T]he growing degree of freedom available to the brain *in principle* had to be balanced with an effective mechanism of constraining it *at any given time;* otherwise there would be the neural equivalent of chaos' (p. 218, emphases in original). So the establishment of cortical autonomy sees the paradoxical emergence of a mechanism of control, the executive functions, with the development of the frontal lobes. For Goldberg this paradox may be regarded as a general principle of all complex systems and similar processes can be discerned in the evolution of both society and digital systems.

More specific claims are also made by Goldberg:

i) The general functions of the left and right cortical hemispheres are aligned with the management of familiar and novel tasks respectively.

ii) Two basic types of decision making are identified; 'veridical' (where there is a single correct solution that may be achieved algorithmically) and 'adaptive' (where the context is ambiguous and no single correct answer is possible) decision making (pp. 77-78). Ambiguity, a feature of 'most real-life situations' (p. 77), is dealt with through one of two general cognitive 'styles' associated with the frontal lobes; the context-independent and context-dependent styles.

iii) These 'styles' differ in prominence across with sexes, the males being more prone to a context-dependent cognitive style and females more likely to follow a context-independent style.

iv) A dynamic between conservatism and innovation exists in society where left-handers, a minority group in terms of handedness, 'represent the restless, creative, novelty-seeking ferment in history' (p. 103).

v) A 'global dimension of human mind' (p. 104) exists, referred to as the '*S* factor (*S* for "smart")', an '"executive talent"' (p. 106), which refers to the individual's ability to form a '"theory of mind"' (p. 107) of the other. The more one lacks the *S* factor, the more one has the '*D* factor (*D* for "dumb")' (p. 107).

vi) Distinct forms of frontal lobe pathology are identifiable: The first, linked with lesions of the dorsolateral frontal lobe, results in what is commonly referred to as '"pseudodepression"' (p. 117), and is associated with the loss of agency. The second, linked to the orbitofrontal structures, referred to as '"pseudopsychopathy"' (p. 139), is associated with a loss of 'social maturity' (p. 141).

vii) Particular disruptions of frontal lobe connections have also been associated with core features of a variety of neurological and psychiatric disorders[8] including traumatic brain injury (TBI), schizophrenia, attention deficit/hyperactivity disorder (ADD and ADHD), and Tourette's Syndrome (TS).

viii) There is some evidence that a new drugs which have the 'primary and explicit purpose… to improve cognition', and are thus called 'cognotropic', have some effectiveness (p. 194). A specific area of investigation, 'cognotropic frontal lobe pharmacology' (p. 196), also promises the improvement of related functions.

ix) A 'new rationale' (p. 210) has developed in cognitive rehabilitation, where '*[r]ather than attempting to shape or reshape specific mental processes, [we] try to reshape the brain itself*' (p. 206, emphases in original).

x) In terms of preventative medicine: It is possible to 'protect the *whole brain* against the effects of diffuse degenerative disease' via a '*comprehensive cognitive fitness regimen*' which engages 'various parts of the brain in a balanced and scientifically grounded manner' (p. 212, emphases in original).

[8] It should be noted here that psychiatric disorders are controversial categories whose validity remains under vigorous dispute.

Given this overview, meant to orientate the reader to the scope and nature of Goldberg's claims, we can now move on to the primary object of his discourse; the frontal lobes. Most, though not all, of the above claims will be addressed across this chapter.

CONTROL *SOUS RATURE*: THE FRONTAL LOBES AS 'CONDUCTOR'

The central analogy in Goldberg's text is that the frontal lobes may be likened to a 'conductor', where the rest of the brain is seen as the 'orchestra', with the posterior neocortex in particular described as the orchestra's 'front row' (that is, the site of its 'most accomplished players') (p. 37). This 'orchestra' then consists of a 'large number of players', each fulfilling a particular function (p. 37). Aside from this musical analogy, a number of other similar analogies are also used by Goldberg, from the world of business (the 'chief executive officer'), the military (the 'general'), and theatre (the 'stage director') (p. 21), all implying the individual who co-ordinates and leads others in concerted action. In this way the frontal lobes are typified as the 'brain's command post' (p. 2). Through this analogy Goldberg proposes a particular relation of power between the anterior structures and the rest of the brain; the frontal lobes direct and control the other neural structures and thus, taking this to its natural conclusion, they dominate the rest of the body as well.

As an intimately connected structure, the frontal lobes constitute the '"nerve centre" of the nervous system' of the brain (p. 114)[9]. However it is an oddly empty centre. First, this refers to an elusiveness, the 'silent lobes' were named so for a reason, their functional role was/is difficult to articulate (p. ix). This is partially due, as Goldberg shows, to their function not being singular, these not being easy to label - at least not with the same ease with which the perceptual roles of various areas of the posterior cortex have been named. Second, a point that I will return to at the end of this section, the functions of the frontal lobes are 'meta-cognitive' (or 'executive'), that is, above (or in control of) 'cognition', the latter ascribed to the posterior cortex and the parts of the frontal lobes not taken up by the prefrontal cortex (p. 26). As the site of the meta-cognitive, the frontal lobes are thus, in a way, free of content (cognition): Meta-cognition (or the 'executive functions') is cognition

[9] See discussion of the 'centre' motif in neuroscience history in Chapter 2.

(in the sense that we are still dealing here with the analogue digital process of neural transmission) which is not cognition (since it is now superior to the other, superior in the sense of being in control)[10]. As we will see, things are more complex than this.

In more concrete and broad terms, the function of the frontal lobes is that of a 'mental juggler', that is, it is involved in the organisation, selection and rapid switching between 'information' (p. 75). This is referred to by Goldberg as 'working memory' (p. 72) and refers to the fluid and continuous selection of 'information' from the rest of the brain which the frontal lobes brings and holds 'on-line' as required within the contingency of the moment[11]. Thus, he claims, the frontal lobes are the site of the 'most advanced and complex functions in all the brain, the so-called executive functions', the 'most uniquely "human" of all the components of the brain' (p. 2), which then enable 'intentionality, foresight, and planning' (p. 23). The frontal lobes 'know what type of information is stored where, but not the specific information itself' (p. 74); in more Derridean terms, they 'contain' (or, rather, are constituted of) traces of traces.

Aside from such cognitive terms, Goldberg also articulates the role of these structures in a more grandiose discourse. Here his introduction to the frontal lobes may be read as a series of bold equations. As Nietzsche points out, 'making equal' is a process typical of the institution of knowledge (Spivak, 1974, p. xxvi). There are numerous instances of such equalising: The frontal lobes 'makes you who you are', 'defines your identity', and 'encapsulates your drives, your ambitions, your personality, your essence' (p. 1). While damage to the posterior lobes results in the loss of 'an attribute of your mind', damage to the frontal lobes goes beyond this: What *is* lost '*is* your mind, your core, your self' (p. 1, emphasis in original). Sacks, in his foreword, softens the equation, pointing out that the frontal lobes are '*crucial for* higher consciousness, for judgement, for imagination, for empathy, for identity, for "soul"' (p. ix, emphases added). Goldberg refers to the neurologist, Tilney, who in 1928 'suggested that the entire human evolution should be considered the "age of the frontal lobes"' (p. 23). A little later, he refers to Michelangelo's

[10] I return and develop this rather obscure claim later in this section.

[11] See the previous chapter (Chapter 5) where Damasio utilises the concept in quite a similar way.

painting, *The creation of Adam*, and indicates how 'God's mantle has the distinct outline of the brain' and how 'God's finger, pointing toward Adam and making him human, projects from the frontal lobe' of His mantle (p. 24). Accepting this as probably coincidence, Goldberg still cannot imagine 'a more powerful symbol of the frontal lobes' profound humanising effect… The frontal lobes are truly, he quotes Luria, "the organ of civilisation"' (p. 24)[12]. Thus the frontal lobes are identified as that anatomical structure responsible for our humanity, our civility. By implication all functions associated with them are then those functions that identify us as human or civilised. Within this seemingly megalomanic equating of neuroanatomical structures to such a profound array of notions, I will concentrate on and return to this latter term, 'civilisation', later on in this section.

The analogical equating of the functions of the frontal lobes to that of 'conductor', 'general', 'leader', 'chief executive' and so forth; their identification as the site of the 'executive functions' (of 'meta-cognition'), is an equation that is troubled (complicated, sullied, imbalanced) in several ways. This troubling is not an inversion in the sense of, say, a simplistic reading of the Hegelian master/servant dialectic, where the latter (the rest of the brain) is revealed to actually be in control, that is, an inversion where the notion of control is retained unchanged. What is meant here is an analysis that does not show that the depiction of the frontal lobes as leader is a ruse, an error, but rather illustrates that the notions (for example, that of 'connection') that allow Goldberg to ground such an analogy simultaneously act as the grounds that undermine such a characterisation. What is then revealed is that the relationship between 'conductor' and 'orchestra', between the benevolent controller and autonomous subjects of Goldberg's new order, is one of 'mutual contamination' (Royle, 2000, p. 9). That which sets up the frontal lobes as the 'conductor'

[12] A variation of *The creation of Adam* appears on the cover of the 2002 paperback edition of *The Executive Brain*. What is interesting are the erasures and changes from the original painting evident on this cover. The image of Adam is erased and God's mantle (as brain) taken from behind Him to occupy the place of Adam. The (dorsolateral) pre-frontal lobes are now the site of God's touch; it is these areas that are marked as the evidence of God's intervention/creation – the point of contact with the metaphysical (See Chapter 2). The body, the whole person for that matter, is replaced by the brain with the prefrontal lobes highlighted – this is the site of the 'civilised mind'. Not only that, but the entire context is replaced by a black background; the environment (the earth that Adam lies on) is erased. One only has to replace God with Adam or erase the Other entirely to perfect this image of neuroreductionism and/or rid the scene of any metaphysical reverie. See page 3 for a copy of the original painting.

simultaneously subjugates them. Such a contamination indicates the impossibility of the full presence of the leader (as site and as function); that we are dealing here with a reign that is always already usurped or, put in more religious-poetic terms, that the entire function of the return of Christ is that of its promise. The frontal lobes are then, in a certain sense, both conductor and orchestra, neither fully leader nor fully player. The relationship confounds any such clear distinction.

A quick aside: In her articulation of deconstruction (what she calls 'Deconstruction in a nutshell'), Spivak (1974) notes the importance of locating the 'promising marginal text' (p. lxxvii). This then leads to the identification of the undecidable moment which subsequently allows for the reversal and displacement of 'the resident hierarchy' (p. lxxvii). In the context of this analysis I would like to include a particular marginalised text, one that is present as a reference in the notes section, referred to continuously across the text and described by Sacks as a 'groundbreaking paper' supported by 'massive evidence' which was 'largely ignored' (p. xiii). Thus it is an article that lay marginalised, a blind spot, within its own discipline. Since it provides engaging and useful articulations of points in the 2001 book, I will refer to it, a marginalised marginal text, but then in a marginal way; that is, I refer not to the original 1989 publication but to an expanded version of the article published as a chapter by Goldberg in 1990.

Unpacking Culler's argument on the relationship between 'philosophy' and 'literature', Hurst (2004) states the following:

> The act of instituting anything (schools, artworks, political systems, gender roles, etc.) *requires* the reduction of "literature" (the unlimited play of imagined possibilities) to "philosophy" (the actualization, via decision, of a system limited by "ground-rules") (p. 260, emphasis in original).

Thus, according to the above, the 'decisive act of institution', for which we can understand any purposeful, founding or establishing act, entails both a distinction between 'literature' (the aneconomic aspect of *différance*, the originary violence) and 'philosophy' (the

economic aspect of *différance*, the Law) and, in the process (the secondary violence) of bringing 'anything' about, the reduction of the free play of the former to the order of the latter (Hurst, 2004, p. 260). But this act shows that this order is then 'itself the work of literature (i.e. a necessary fiction)' (Hurst, 2004, p. 260). This is a significant observation since it shows that the reduction (be it to the author, the institution, the goal, or the plan), this economic process, this imposition of law, is both *necessary*[13] (since without it nothing would be constituted) and a *fiction* (in that it is one reading, a contingent product, and thus not essential or Truth).

The above, already discussed in some detail in Chapters 4 and 5, is important in establishing a deconstructive understanding of Goldberg's 'leadership paradox' in which he distinguishes between and justifies the processes of 'autonomy' and 'control' in the brain. In terms of the latter it is the frontal lobes that 'are the instrument, and the agent, of control within the central nervous system.' (p. 215)[14]. He goes on to suggest that the development of the frontal lobes 'were probably driven by the increasing degrees of freedom in brain organisation and by the impending potential for chaos within it' (p. 215). But what does Goldberg mean by this 'freedom'? In order to answer this question we need to first consider the distinction Goldberg draws between the 'modular' and 'gradiental' principles of cerebral organisation which then sets the ground to discuss his distinction between the 'prededicated' and 'emergent' principles of functional cortical organisation. This allows us to understand how this necessary freedom requires necessary control.

Goldberg describes the evolutionary emergence of a form of cortical organisation, referred to as the 'gradiental principle'[15], by which he means an intimate, or isomorphic,

[13] Goldberg states this nicely with the Roman proverb 'Dura lex sed lex' (Hard law is better than no law) (p. 79).

[14] The contradictory assertion made here by Goldberg should be noted; the frontal lobes are both 'the instrument' and 'the agent' of control. I return to this point later in this section.

[15] Goldberg uses the term 'principle', signifying a fundamental truth or general law, to describe what is a 'form' of neural architecture. This modernist discourse may be contrasted with Cilliers' (1998) more modest reference to the 'characteristics' (features, attributes, traits) of complex systems. Here I am also reminded of Spivak's framing of 'concepts and theoretical principles, not as guidelines, rules, principles, or blueprints for struggle, but as tools and weapons of struggle' (Grosz, 1990, p. 342).

relationship between the spatial and functional dimensions of the neocortex, that is, that 'two cortical areas are functionally close… if and only if they are spatially close' (Goldberg, 1990, p. 231)[16]. So 'a gradual transition from one cognitive function to another corresponds to a gradual, continuous trajectory along the cortical surface: 'The way cognition is distributed throughout the cortex is graduated and continuous, not modular and encapsulated' (p. 59). This 'continuous principle'[17] can be plausibly linked to the 'interactive principle', where 'every unit has multiple connections with other units' as opposed to the 'modular principle' where 'encapsulated units [are] connected amongst themselves only through input-output relationships' (Goldberg, 1990, p. 264).

Thus the distinction (in the 2001 text) between the modular and gradiental principles of cortical organisation is that: In the former type of organisation the neural landscape is comprised of discrete 'modules', with limited interaction and physical connections between these components and where the functionally related modules do not have to be physically proximate to each other (distance establishing a mosaic pattern). In the latter, the 'units' are less easily circumscribed due to the richness of connections between these components. In fact, Goldberg (1990) troubles his use of the term 'unit' when he says that 'it may be more appropriate to talk [of] somewhat arbitrarily specified "locations" in the network than about "units" in an absolute sense' (pp. 264-265). Unlike in the modular form of organisation the transfer of information between modules is not '"bursts"' but is a 'temporally continuous, uninterrupted information flow' where 'it may be more appropriate to describe information processing in continuous terms of *flow* than in discrete terms of stages' (Goldberg, 1990, pp. 264-265, emphasis added). Furthermore, functionally related 'units' are in physical proximity of each other. The two forms of organisation are best illustrated by contrasting the subcortically located thalamus, comprised of numerous functionally and spatially discrete and sparsely interconnected nuclei, with the neocortex; 'a

[16] This, of course, implies a remarkable intimacy between materiality and cognition which challenges a Cartesian reading of mind still notable in first-generation cognitive science (see Chapter 3). I return to this point across this chapter.

[17] Goldberg opposes the 'continuous principle' to the 'mosaic principle' in the 1990 text. What is called the 'gradiental' principle in the 2001 text is really a conflation of the 'continuous', 'interactive' and 'emergent' principles discerned in the 1990 chapter. Similarly, the 'modular' principle of the 2001 text is a conflation of the 'mosaic' (phrenological), 'modular' and 'prededicated' principles of the 1990 text.

sheet without distinct internal borders, with rich pathways interconnecting most areas with most others' (p. 217) and where, according to Goldberg, there is evidence that related functions are physically close to each other.

In referring to 'freedom' Goldberg leaves this term, surprisingly, fairly unspecified and a number of inferences have to be made. The gradiental form of cortical organisation makes the brain 'capable of processing a far greater degree of complexity' (p. 218) due to having 'far greater computational powers' (p. 32). In comparing the development of the brain to that of digital systems Goldberg aligns freedom with the ability of distributed personal computer systems to perform a 'greater range and variety of tasks' than mainframe systems (p. 225). As already indicated, he also links the term to 'autonomy', where, using the CEO analogy, he refers to the importance of a balance between control and autonomy, where a good manager 'knows when to step in and impose his will and when to step back…' (p. 22). Another principle that Goldberg links to the continuous principle (especially in his 1990 chapter), is the 'emergent principle'. This again implies a form of freedom, where the function of neural tissue is not determined *a priori*, that is, it is not 'genetically prespecified' (the so-called, 'prededicated principle') but, rather, such tissues '*assume* their function through self-organising processes in neural networks as a result of their interaction with the environment' (Goldberg, 1990, p. 266, emphasis in original)[18].

Hence 'freedom' is equated with a particular organisation of neural materiality; the gradiental form of cortical architecture. This complex structure increases the brain's ability (its computational power) to deal with complexity, it allows for a greater functional diversity and increased functional independence (the reduction of centralised control), as well as increased environmental adaptation through the contingent (experience based) determination of function. The relation between the brain and that which surrounds it is therefore intimate, allowing 'flexible adaptation', that is, in more evolutionary discourse, an increased chance of survival (p. 217).

[18] I return to this point in the final section of this chapter where I consider the intimacy implied between cognition, neural materiality and the environment – undermined by the continued presence of social/biological and mind/body distinctions.

It is then these adaptive advantages which leads Goldberg to quote Friedrich Engels' expression; '"Freedom is necessity recognised"', and terminates in the specification of the 'leadership paradox', which refers to the 'the peculiar relationship between autonomy and control' (p. 226). Here he means the paradoxical return of control in the climate of cortical autonomy, the former being necessary (just as degrees of freedom are essential for survival in a complex environment) to prevent disorder. As Goldberg states, 'the growing degree of freedom available to the brain *in principle* had to be balanced with an effective mechanism of constraining it *at any given time;* otherwise there would be the neural equivalent of chaos' (p. 218, emphases in original).

What is meant here by 'chaos'? Here we have to turn to Goldberg's discussion of frontal lobe pathology, specifically the behavioural consequences of damage to the dorsolateral aspects of the prefrontal cortices. The dorsolateral syndrome is associated with a 'plethora of clinical manifestations, including perseveration (the failure to make a complete transition from one (aspect of a) task to another), aspontaneity (the inability to initiate or terminate an action), field-dependent behaviour (which includes 'utilisation behaviour' where the person engages with an aspect of the environment simply because it is present), imitative behaviours (copying the verbal and other behaviours of others), and stereotypic behaviour (the constant repetition of a complex behaviour pattern) (Goldberg, 1990, p. 256).

With less severe damage, one has the emergence of 'field-dependent behaviours', which, as indicated, includes '"utilisation behaviour"', where objects in the environment 'determine' the behaviour of the person (p. 125). For example, the person enters doors simply because they are present or picks up a pencil simply because it is lying on the table in front of her. Goldberg refers to field-dependence as a 'complex phenomenon' that 'may take many forms': The person may be 'driven by external stimuli' or 'driven by internal out-of-context associations' (p. 126). The outcome is that 'the ability of a frontal lobe patient to stay mentally on course can be disrupted by both internal and external distractors' (p. 126).

Goldberg refers extensively to one of his patients, Vladimir, who, after being struck by a train, underwent 'surgical resection of both frontal poles' (p. 118). Some time after this

accident Goldberg asks him to repeat a simple story, a common test used during functional assessment. Vladimir responds but: 'His tale *spins by itself*, through *no apparent mental effort or intentional contribution on his part, one association or external stimulus leading to another*' (p. 126, emphases added). What emerges has little resemblance to the original story, what materialises are endless associations, drawing in and spinning together details from his immediate environment and internal associations into a never ending 'narrative'. Goldberg eventually switches off his tape recorder and leaves; Vladimir is left behind droning on until, eventually, he grinds to a halt.

The damage leaves behind, what Goldberg calls, a reactionary 'Newtonian body' which, once set in motion by external prodding (since the person is typically passive and non-responsive, that is, 'pseudodepressive'), is buffeted back and forth by an endless flow of internal associations and external stimuli (p. 120). The person becomes a 'signifier' in a web of associations, caught in a free play of actions and personal and semantic associations with no internal institutionalisation, no inner bearing of intention, will, effort, or imposition of the Law. The associations spin by themselves, the field of associations is at play; the agent, the intention, the imposition of secondary violence, is absent. The distinction between external stimulus and internal association, that is, the imposition of a boundary between the objective visible and subjective invisible, should not be taken too seriously since all objects pass through the matrix of the neural system and everything acts as points for association whether this be in relation to perception or other neural patterns.

Here then there is no 'leadership' from the frontal lobes, and what is left is the play of associations. This lack of inhibition is also noted in the other form of prefrontal lobe damage, that of the orbital regions[19]. The so-called '"pseudopsychopathic"' syndrome, the condition noted by Goldberg for its lack of social maturity, where 'most such patients come across as lacking in inhibitions, "loose" but harmless': '[U]ntoward traits are caused by the damage of the orbitofrontal regions of the brain and are not under the patient's control', but are the result of '"orbitofrontal disinhibition"' (p. 140).

[19] This type of damage and its consequences is explored in detail by Damasio and is discussed in Chapter 5.

At this point the resemblance between the reduction of 'literature' to 'philosophy' (Hurst, 2004) and the constraint of neural freedom through the control of the frontal lobe structures should be noticeable. This control refers to organisation of brain function through the selection and sequencing of activity within a particular context, it is the imposition of an order or, in more Derridean terms, an economy, a necessary fiction. This imposition is on a structure characterised by various forms of freedom or autonomy (play or the aneconomic in Derridean terms), which becomes more visible in instances of disrupted frontal lobe function, resulting in a free associating, free utilising, and/or disinhibited organism. This is a being from which the agent, that which acts with intention in a neural climate marked by the aneconomic, is to various degrees absent.

To return to Goldberg's earlier differentiation between the frontal lobes and the rest the brain on the basis of a hierarchical distinction between the meta-cognitive (the executive functions) and the cognitive; it will now be demonstrated how this distinction is troubled in several ways: i) Through reference to the recursiveness of neural connections. ii) Due to the fact that the 'civilised mind' is always already being mediated by the uncivilised. iii) By showing how the frontal lobes are structures that require continuous contingent supplementation. And, finally, iv) by demonstrating how the control/autonomy binary is grounded on an order ('standardisation') *sous rature.*

Connection

Sacks refers to the 'unique richness of the frontal lobes' connections to different parts of the brain' (p. x) and Goldberg indicates that a 'command post is only as good as its lines of communication with the combat units' (p. 35). Consequently, 'the prefrontal cortex is probably the best-connected part of the brain', since it is 'directly interconnected with every distinct functional unit of the brain' (p. 35). It connects to the 'posterior association cortex' (the 'highest station of perceptual integration') and the 'premotor cortex, basal ganglia, and the cerebellum' (associated with 'motor control and movements') (p. 35). Connections also extend to the 'dorsomedial thalamic nucleus' (the 'highest station of neural integration within the thalamus'), the 'hippocampus' (which is 'critical for memory'), the 'cingulate cortex' ('critical for emotion and dealing with uncertainty'), the 'amygdala' (which

‘regulates most basic relations between the individual members of the species’), the ‘hypothalamus’ (which exercises ‘control over the vital homeostatic functions’), and ‘the brain stem nuclei’ (involved in ‘activation and arousal’) (pp. 35-36). Thus only ‘the prefrontal cortex is embedded in such a richly networked pattern of neural pathways’, making it ‘singularly suited for coordinating and integrating the work of all the other brain structures – the conductor of the orchestra’ (p. 36).

Earlier on Goldberg points out that the complexity of the brain is ‘further increased by *ubiquitous feedback loops* with *the activity of the signal source being modified by its target*, both local and global, both structural and biochemical’, and as ‘a result, the brain can produce a virtually infinite array of different activation patterns, corresponding to virtually infinite states of the outside world’ (p. 28, emphases added). This omnipresent recursive characteristic of the nervous system is illustrated in Goldberg’s discussion of the attentional system, which he describes using ‘the flashlight analogy’ (p. 171):

> To pursue the flashlight analogy further, let us remind ourselves that a flashlight is an instrument. Someone (or something) must be responsible for choosing the direction in which it is pointed and for maintaining a steady hand. In neural terms, this means that the goal of action must be identified and must effectively guide behaviour for a period of time. We already know that goal-setting and goal-maintenance are provided by the *prefrontal cortex*. This is the actor whose hand controls the flashlight. The flashlight analogy also implies the stage in need of illumination. The stage is found in the brain mostly in the *posterior aspects of the cortical hemispheres.* These are the structures most directly involved in processing the incoming information. Depending on the goal at hand, distinct particular parts of the posterior cortex must be bought into the state of optimal activation (illuminated by the flashlight so to speak). The selection of these areas is accomplished by the prefrontal cortex, which directs the flashlight accordingly. The flashlight itself is found in the nuclei of the *ventral brain stem*, which can selectively activate vast cortical regions through their ascending projections. The prefrontal cortex guides the ‘flashlight’ through its own descending pathways into the ventral brain stem.

> Finally, the prefrontal cortex *modifies* its control over the flashlight, based on the *feedback* it receives from the posterior cortex. In sum, attention can best be described as a looplike process involving complex interactions among the prefrontal cortex, ventral brain stem, and posterior cortex. (p. 171, emphases in original)

The point that I would like to emphasise here is that the distinctness of the distinction between frontal control and posterior autonomy is less than clear. Other sites of influence are made apparent including that of the subcortical brainstem structures and the posterior cortex. Another punctuation of the above analogy is that the posterior lobes act as a hand that guides the hand holding the flashlight. In a system marked by 'ubiquitous' connections that either directly or indirectly impact on the 'location' of the action, it seems difficult to then locate a 'conductor'.

Another consequence of this rich interconnection is what Sacks refers to as 'secondary disturbance' (p. x). For the living organism, the existence and continued health of the frontal lobes is vital, since without them, to use the analogy, 'there would be no product, no concert, no show' (p. 22) - a system (the brain) without a leader (the frontal lobes) collapses. Goldberg demonstrates this point again and again, turning to a central preoccupation of neuropsychology, the study of neuropathology, in order to demonstrate the nature of the brain in healthy and natural order. For example, the first signs of dementia, the umbrella term for (often progressive) cognitive decline, are usually first visible in the decline of functions associated with the frontal lobes, since, given their intimate interconnection with the rest of the brain, this renders them particularly vulnerable and sensitive to pathology in any part of the brain. Here the notion of 'secondary disturbances' is used; an ineffective leader is often a sign of a disturbance elsewhere in the system (p. x). The notion of 'connection' forms a central explanatory concept in Goldberg's discussions of such pathology; traumatic brain injuries are about broken connections (often between the frontal lobes and other structures vertically or horizontally), schizophrenia is about non-existent connections, and attention deficit is about fragile connections. These are the frontal lobes' essential 'lines of communication' without which they become isolated and impotent (p. 35).

So the more richly interconnected the structure, as the frontal lobes are, the more in control (influential) *and* the more controlled (influenced and vulnerable) they are. As indicated, the complexity so central to the organism's increased survival is a product of feedback, but this architecture also then decentres control, making every structure in the neural network simultaneously passive and active, reactive and proactive, an instrument and an agent.

Civilisation

As already mentioned, the frontal lobes are positioned by Goldberg as '"the organ of civilisation"' (p. 24). The title of his book aligns these structures with the 'civilised mind'. He also indicates that the 'prefrontal cortex is the closest there is to the neural substrate of social being' (p. 111). But what is meant by the alignment of these structures with organised co-existence?

In terms of the evolution of the species, the frontal lobes are positioned as temporally prior to civilisation[20]. Through the tremendous growth of these structures emerges several cognitive capacities, including a substantial *working memory* capacity, referring to the ability to create, hold, shift between and manipulate 'images of the future' (imagination and planning) and symbols (language). This is regarded as having provided an indispensable condition for tool making, allowing for environmental domination and the emergence of civilisation (p. 25). Also linked to the frontal lobes is the ability to *inhibit* (regulate, control) 'the immediate impulse', this being essential so as to 'follow the internal plan, the task, against your natural, entrenched tendency' (p. 127). These capacities are tied to 'the biological maturation[21] of the frontal lobes [which] takes place at the age that has been codified in virtually all developed cultures as the beginning of adulthood' (p. 3). In bringing impulses 'under the control of reason', the young adult is able to join 'the world of civilisation' (p. 144).

[20] The pre-social being a problematic notion addressed in the chapter on *Damasio's error* (Chapter 5).

[21] Goldberg remains ambiguous about what this 'biological maturation' entails; whether it is a genetic process or whether it is tied to social processes. As we see later the latter remains an intriguing idea to him which his notion of an emergent associative cortex supports.

In terms of evidence, forms of frontal lobe damage and disease, such as the orbitofrontal lobe syndrome, have been linked to asocial, if not anti-social, behaviour. Whereas the, previously mentioned, dorsolateral prefrontal cortex syndrome patient is 'devoid of personality', 'orbitofrontal patients' are identified by Goldberg as having '"immature"' personalities (p. 140). Thus, 'in many ways the opposite of the dorsolateral syndrome', patients with orbitofrontal damage are 'emotionally disinhibited', have an impaired 'ability to inhibit the urge for instant gratification', show 'no foresight of the consequences of their actions', and engage in 'antisocial' behaviour, displaying a sense of humour that 'resembles that of a drunken adolescent' (pp. 139-140). The person with demonstrable orbital prefrontal cortex damage is an individual who lacks the self-control (self-inhibition) required by society[22]. Accordingly Goldberg asks whether it could be that 'the prefrontal cortex contains the taxonomy of all the *sanctioned, moral actions and behaviours*' (p. 142, emphases in original)? Could it be that like damage to the posterior association cortices results in object agnosia, damage to, or the 'maldevelopment' of, the prefrontal cortices results in '*moral agnosia*' (p. 142, emphases in original)?

The process of development is one of internalisation, that is, the 'inscription' of the extra-neural (cultural and moral) through processes of self-organisation. Goldberg explains as follows: The 'accumulation of ready-made cognitive "templates"', which are 'stored externally through various cultural means, including language… are *internalised* by individuals in the course of learning as cognitive "prefabricates" of sorts' (p. 52, emphasis added). In the 1990 chapter, Goldberg links 'internalisation' with the emergent principle. This capability is most typical of the associative tertiary areas of the neocortex, of which the prefrontal cortex is one example. These areas assume their function 'through self-organising processes in neural networks as a result of their interaction with the environment' (p. 266); the resultant cortical localisation in the mature adult brain is then a 'product of statistically prevalent cultural and experiential circumstances' (p. 267).

Opening up the cortex to the social leads Goldberg to Allan Schore's 'provocative hypothesis'; that 'early mother-infant interaction is important for the normal development

[22] This forms an important theme in Damasio's work and is discussed in Chapter 5.

of the orbitofrontal cortex during the first months of life' (p. 141). In particular, that 'early life stressful experiences may permanently damage the orbitofrontal cortex, predisposing the individual to later-life psychiatric diseases' (p. 141). Thus it seems that 'early social interactions shape the brain' (p. 141). Goldberg wonders whether it is 'possible that social stimulation is to the development of the frontal cortex what visual stimulation is to the development of the occipital cortex' (p. 142), whether 'there [is] a relationship between environmental orderliness (as opposed to chaotic environment) and the maturation of the frontal lobes' (p. 142)?

Locating civility, the effective negotiation of socio-cultural constraints, in the cortical organisation of the prefrontal cortex has interesting consequences for the notion of control. What reaches the anterior 'site' (equated to the social, the moral, and the civilised) must of course always already have passed through the posterior or subcortical (the non-social, non-moral, and non-civilised other). Therefore what impacts on prefrontal organisation must always already have been mediated by, have passed through the censorship of, been constrained (inhibited) by, these other structures. Not only are the frontal functions preceded (in evolution, maturation and procedure) by those structures which they are said to subjugate, but these structures 'control' what is made available to these anterior structures. Furthermore, this posterior landscape is comprised in part of the primary cortices, those terrains most closely linked to the extra-neural, whether corporeal or environmental. These are prededicated sites, what Goldberg calls the 'cognitive primitives' (1990, p. 268) and the 'genetically prespecified' (1990, p. 266), that is, the trans-individual. Thus the contingent, the emergent, the 'resultant', passes through the remnants of history, the sedimented or pre-structured (p. 267). The frontal lobes are the site of functions of inhibition, of organisation, of control, but these functions are themselves already inhibited, organised and controlled by what they manage. The ability to deal with complexity enables each organism a unique adaptability to the context in which they find themselves (and from which they emerge) but this is preceded and followed by the invariant (the primary sensory and motor cortices) which exercise their own control over what emerges.

Supplementation

As a '"nerve centre"', the frontal lobes are a hub *sous rature*, a centre always decentred. It is a core as ideality (presence) rather than a practical reality, where the task at hand sets up a circuitry that always exceeds the localisation of the executive in the prefrontal cortices. Goldberg's 'executive brain' is a form of control always in need of supplementation. With reference to various functions the frontal lobes are never enough in themselves; invariably the discussion of the fontal lobes in relation to some topic involves some addition; the bringing on board of another structure of the brain.

The above can best be demonstrated by considering two of Goldberg's discussions on pathology. In his section on Tourette's syndrome (or 'Tourette's spectrum', since we seem to be dealing with a multiplicity of related conditions), Goldberg points out that it is believed that the associated behaviours are the result of the caudate nuclei escaping 'from the control normally exerted over them by the prefrontal cortex' (p. 182). In Tourette's syndrome 'the moderating influence of the frontal cortex on the caudate nuclei is weakened' (p. 182). The caudate nucleus, a basal ganglia structure, is however regarded as 'part of the "greater frontal lobes"' (p. 31) and found to be 'critical for the initiation of movements and more complex behaviours' (p. 182). Given this, the control of behaviour would then require both the inhibition of the prefrontal cortices and the initiation of the caudate nuclei. In this scheme each structure is only half the picture; control emerges through a relationship that exceeds the physicality of the 'executive lobe'.

The anterior cingulate cortices form part of the '"metropolitan frontal lobes"' with 'the prefrontal cortex and the basal ganglia' (p. 142), and is associated with the inhibition of distress. According to the argument, this ability 'is fundamental to social interactions'. Distress, involving the amygdala, is a 'negative emotion arising from an inability to find immediate gratification' (p. 143). The 'anterior cingulate cortex reins in the amygdala, and by exerting this control tempers the expression of distress' and thus 'makes civilised discourse and conflict resolution possible' (p. 143). Again we see the role of control and the enablement of civility extending beyond the physical immediacy of the prefrontal cortices. Thus, as a '"nerve centre"' the prefrontal cortex is always decentred; in actuality

the executive functions are a centre on the move, their axis shifting continuously depending on the operation or situation at hand.

Standardisation

In his discussion of the leadership paradox, that is, the emergence of control in a landscape typified by autonomous units, Goldberg draws parallels between the development of a number of complex systems; the brain, society and digital technology. With the latter he describes the passage of 'evolution' from mainframe computers to personal computers (PCs) to the internet with its 'frontal lobes', the search engine. It is a process in which there is 'a gradual departure from a predominantly modular to a predominantly distributed pattern of organisation…' (p. 225). The proliferation of PCs arranged in a distributed format mean that 'a greater range and variety of tasks could be performed' (p. 225). It is the next passage, a rather marginal moment in the text, that is particularly important in that it talks back to the neural analogy that Goldberg uses to understand computer systems: 'To ensure that a maximum number of computers could interface, *standardisation* rapidly increased' (p. 225, emphasis added).

To standardise means to introduce uniformity; to homogenise; to make even, regular, consistent or equal; to have shared structures and rules for operation. In this term lies another paradox; the enablement of functional diversity and complexity in a climate of structural uniformity and componential simplicity; 'a network of mind-boggling complexity is constructed of relatively simple elements' (p. 27). That which controls and that which is subjugated are all part of the same field; that is, the microscopic neural complex system which Goldberg describes in the anatomy chapter of his book[23]. This uniformity (an originary regulation) undermines the notion of control (the executive, the meta-cognitive) by flattening out the imposed hierarchy.

[23] In his concluding section Goldberg writes, 'my understanding of the brain, and the heuristic metaphor that guided that understanding, has always been informed by the early intellectual encounter with the concept of the neural net.' (p. 229)

With any claims of control and of freedom, the other of each term returns not as a binary opposite, discrete and autonomous, but as that which is present in the heart of the term, undermining its claim of presence. The means of exercising control, the connection, is simultaneously the means of undermining and dislocating control. The means of freedom (independence, no restriction) is only possible by means of an underlying order, the diacritical neural network[24], which simultaneously constrains that freedom. Prior to the control of the frontal lobes is the regulation of a more general order, one that undermines distinctions between meta-cognition and cognition, between control and autonomy. These binaries are impositions on an order where there are only neurons and connections, and where functions emerge, whether pre-determined or contingent, through the patterns of relationships between these 'units'. Such a network provides an order, a standardisation, but it is an order *sous rature* in which there is no ground except, as Derrida pointed out, the play of *différance*.

In 1990, Goldberg writes of the 'fictitiousness of absolute borders between cognitive functions' and how the relativity of borders between memory and attention, memory and coding, attention and executive controls, and so on' is being increasingly emphasised by various scientists (p. 268-269). In the same chapter he questions the utility of notions such as 'module', 'unit', 'input' and 'output', suggesting that perhaps reference to 'somewhat arbitrarily specified "locations"' and 'temporally continuous, uninterrupted information flow' are more appropriate (p. 264). He writes of how we attempt to describe essentially continuous distributions in finite terms, by imposing a finite taxonomy' (p. 268) and that 'nature is under no obligation to accommodate the intellectual ambitions of cognitive psychologists, neuropsychologists, and the like' (p. 270).

(And, of course, remembering Derrida, we acknowledge that we have no choice but to work within the limitations of such a finite discourse, 'using the language that comes to hand (along with its inescapable logocentric residues)' (Hurst, 2004, p. 261). But also, we humbly recognise the violences of the economic and aneconomic, 'philosophy' and 'literature', fiction and text, order and excess. And, thus, we note the continued imposition

[24] See discussion on connectionism in Chapter 8.

on the brain of both the predetermined and emergent, the modular and the gradiental, the primary cortical projections areas and the tertiary associative heteromodal areas, the thalamus and the neocortex, the executive and its other.)

The above analysis attempted to explore Goldberg's fiction, his own finite taxonomy, both necessary and convenient. It is no easy task 'describing' one complex system (the nervous system) by means of another (language). The imposition of an analogy (a finite taxonomy) which locates (equates) a function, the rendering of complexity in the binary simplicity of control/autonomy (conductor/orchestra), is bound to be problematic. It is not to say that the frontal lobes do not exercise 'control' (in some snapshot sense, imposing a hierarchy or punctuation where there is (n)one) but it is a control that does violence in its clarifying, it is a fixing, a making static, that obscures how these structures are part of a complex system where, as Goldberg pointed out himself in passing, both are agent and instrument, thus proactive and reactive, active and passive, constraining and constrained, controlling and controlled, autonomous and supplemented, hierarchical and uniform, undecidable.

SYNTHESIS AND SYMMETRY

In this section I deal with two themes; Goldberg's hope for a place of synthesis and his use of symmetry as foundation. This then aligns him with the common tradition in neuroscience concerned with establishing a point of integration[25]. Before moving on to these discussions I first need to introduce his distinction between the right and left hemispheres on the basis of novelty and familiarity.

Right and left: Novelty and routine

Goldberg asks 'whether language is the central attribute of the left hemisphere or a special case, a consequence of a more fundamental principle of brain organisation' (p. 41)? He seeks a principle that transcends the anthropocentrism of neuropsychology, one that traces a commonality beyond the immediate species, and which shows that what is so central to our understanding of our selves, language, is really a particular instance of a more fundamental

[25] See Chapter 2.

left hemisphere capacity. Language is then one example of a 'well articulated routinised code' (p. 47).

Goldberg notes Herbert Simon's belief that learning 'involves the accumulation of easy-to-recognise patterns of all kinds' (p. 43). The learning process itself is characterised by the transition from (stimulus or response) novelty to familiarity. He asserts that the right hemisphere is 'particularly adept at processing novel information' whilst the left hemisphere is 'particularly adept at processing routinised, familiar information' (p. 43). We are thus dealing with 'two different, separate but interconnected systems, one for novelty and the other one for routines' (p. 44). The relationship between the two hemispheres is 'dynamic, characterised by a gradual shift of the *locus of cognitive control* over a task from the right hemisphere to the left hemisphere' (p. 46, emphases added). This transfer, however, does 'not mean a literal transposition of information': Mental representations may 'develop interactively in both hemispheres, but the *rates of their formation differ*. They form more rapidly in the right hemisphere at early stages of learning a cognitive skill, but the relative rate reverses in favour of the left hemisphere at the late stages' (p. 46, emphases added). Thus, using his primary analogy, 'the cerebral orchestra is divided into two groups of players'; 'those sitting on the right of the aisle are quicker at basic mastery of the new repertoire, but in the long run, with due practice, those on the left of the aisle come closer to perfection… In reality each cerebral hemisphere is involved in all the cognitive processes, but their *relative degree of involvement* varies according to the novelty-routinization principle' (p. 52, emphases in original). However this shift in involvement 'occurs on many time scales', from minutes to decades, depending on complexity and degree of exposure (p. 52).

Goldberg supports the above distinction by drawing on diverse forms of evidence: He describes a series of asymmetries between the left (dominant) and (minor) right hemispheres, including forms of animal hemispheric specialisation and morphological difference; he describes the profound effects of paediatric brain damage of the right hemisphere in contrast to similar damage to the left hemisphere; he cites how the computational efficiency of neural network models improves with two (novelty and

routine) systems; and draws on various cerebral blood flow experiments showing, for example, how trained musicians show left hemisphere activation rather than the traditionally expected right hemisphere involvement.

So 'the roles of the two hemispheres in cognition are *dynamic, relative, and individualised*' and 'the distinction between novelty and routinization can be applied to any creature capable of learning' (p. 46, emphases added). In developing this theory, Goldberg stages a double challenge: First, he complicates the continued institution of a particular link; that of language as the specialisation or chief function of the left hemisphere. Importantly he does this without challenging the consistent empirical finding that this hemisphere dominates linguistic processing but by instituting a more fundamental specialisation that still takes care of this 'old knowledge' (p. 46). Second, more importantly, he brings to bear a questioning of the very 'notion of an intrinsic, obligatory link'; the very idea, when it comes to functional-neuroanatomical correlations, that there are associations that can be considered essential and natural (p. 48). Again, he does this by positing, through his right/left distinction between novelty/routine, a dynamic (non)relationship (since we are talking here of a *parallel and complementary* processes differing in rates of formation; what is called 'coding' in traditional cognitive science discourse) where the socio-cultural practices and individual exposures (that is, that which is extra-neural) is sedimented in its contingency. There is no universal or asocial principle as such except for the formation and dissolution of linkages (connections) across two materialities differentiated by rates of (or different temporalities, or dispositions for) sedimentation. We may call this a rabbit and hare theory of hemispheric specialisation, called alternatively the 'novelty-routinization theory of hemispheric specialisation' (p. 47) and a 'dynamic theory of brain-behaviour relations' (p. 48), the latter name capturing the challenge to inherent and mandatory links.

The conductor at large

Goldberg notes that a 'peculiar parallelism exists between the functional organisation of the frontal lobes and the posterior cortical regions' (p. 76). After describing the '"what"' occipitotemporal gradient involved in object recognition and the '"where"' occipitoparietal gradient involved in object location, he refers to a comment by Courtney, Ungerleider, Keil

and Haxby (1996) that it seems that tasks associated with the systems 'produced two distinct patterns of activation within the frontal lobes, in the inferior [orbitofrontal] portions for "what" and the superior [dorsolateral] portions for "where" tasks' (p. 76):

> Apparently, different aspects of working memory are under the control of different regions within the frontal lobes. Does this mean that every part of the prefrontal cortex is linked to a particular system outside the frontal lobes? What happened to the conductor at large? Is there a part of the frontal lobes whose contribution is truly integral? Mysteriously, the area around the frontal poles, the furthest forward extension of the frontal lobe (Brodmann area 10), has so far eluded most attempts to characterise its function in specific terms. I would not be surprised if future research were to show that the areas immediately surrounding the frontal poles serve a particularly synthetic function and superimpose an additional level of neural hierarchy over the dorsolateral and orbitofrontal cortical regions. (p. 77)

Goldberg is faced here with fragmentation, could it be that the sanctity of the prefrontal cortex is violated, that its coherence is a fiction; that its parts are in closer alliance to other structures in the form of systems? This possibility seems disturbing to Goldberg, but why? The answer lies in the next question; what has happened to the 'conductor at large', what has happened to the possibility of a '*truly* integral' contribution? Goldberg's use of the term 'integral' is interesting. It is commonly understood as: i) forming a whole, that which completes, brings closure; and ii) that which is vital, essential, fundamental, basic, primary, central (Sykes, 1978). Thus it signifies not only that which completes (the missing piece) but that which is essential (the necessary piece) to the whole. Here then both meanings are evoked as the hope of such completion lies in the missing; the unknown function of the areas around the most anterior points of the brain; the frontal poles. The possibility of synthesis (the crowning knot) is through the imposition of an 'additional' level to the hierarchy; unity (totality) through the control (and supplementation) of a meta-level. It is also interesting to note Goldberg's use of the term 'synthetic', with its dual common meaning of 'putting together parts or elements to make up a complex whole' and 'artificial'. Could it be that the hope (fantasy) of the frontal poles is the recognition of the

need for an essential level of integrative reproduction or that it is a non-natural imposition; an error unsupported by future observation? Either way, the hope for the closure of the circle (circuit), for the final conductor, for the truly integral, will remain fantasy since, as Goldberg shows, the one is always already two (physically, functionally and temporally).

The above block quote provides an example of the Hegelian strategy of *aufhebung*. As Spivak (1974) specifies: '*Aufhebung* is a relationship between two terms where the second at once annuls the first and lifts it up into a higher sphere of existence; it's a hierarchical concept generally translated "sublation" and now sometimes translated "sublimation"' (p. xi). Given the above structure of Goldberg's argument (Frontal pole areas/rest of brain = synthesis/fragmentation), the frontal pole areas thus lift the rest of the brain into a higher level of wholeness; they close the circle and complete the system. But it is actually more than this; in the same moment that they bring about the (closed) system, the 'conductor at large' emerges; the brain receives its crown.

The vital observation that needs to be made is that, even if the function of the frontal poles were revealed as synthetic, it would never be a unity as hoped, since Goldberg has already undone that possibility. Nowhere is the brain (physically, temporally and functionally) one, rather it is always at least two; meaning that there is no synthesising point as such (there are physically and functionally frontal *poles*, prefrontal *cortices*, prefrontal *lobes*): The lobes are always divided (physically and functionally) by the hemispheres (left and right), whilst the hemispheres are always divided by the lobes (frontal and posterior). The 'synthetic' function for Goldberg means a place, a location, a site, a physical locus where integration can happen. In terms of his central analogy this refers to the search for a central conductor, but in this need we find a contemporary materialist version of Descartes' identification of the singular pineal gland as the material site of the non-material soul. In this sense then his positing of a CEO for the CEO (the repeated insertion of more levels in order to reach the heaven of integration) bears resemblance to Descartes' transcendental cogito, Damasio's ostracised homunculus, and Spivak's identification of the fantasy of the sovereign subject. But Goldberg's pursuit of the One, the top of the hierarchy where everything comes together, is always already itself divided across two lobes that display different patterns of

activation and response formation. These differing dispositions, these differing relations to repetition and temporality, split the conductor, smudge it across (the) difference (associated with these hemispheres).

Thus we are left with a Derridean response to a Hegelian strategy[26]; we are dealing with neither synthesis (the closure or sealing of the brain) nor fragmentation (the division or disintegration of the brain), but with a brain that is both one and two, the ideality of each undermined by constituting presence of the other. The necessity of this aporia is noted by Donna Haraway (1991, p. 177), who writes in her *Cyborg Manifesto* that:

> To be One is to be autonomous, to be powerful, to be God; but to be One is to be an illusion, and so to be involved in a dialectic of apocalypse with the other. Yet to be other is to be multiple, without clear boundary, frayed, insubstantial.

The brain's identity, its unity, emerges through temporal and simultaneous relations of difference; the former constituted and ruptured by the latter, the latter given form and impoverished by the former.

Symmetry as foundation

Aside for this nostalgia for a crown, a second longing, that for a foundation, is echoed in the identification of symmetry as being more fundamental than asymmetry. Whether centre or foundation, whether vantage point or base, we are dealing here with a need for presence, this for a system that shows its lack of centre and foundation in the very same text in which these presences are asserted. In Goldberg's discussions of cortical organisation (in both the 2001 and 1990 texts), he repeatedly indicates how the (previously discussed) gradiental principle is primary; in the sense of being more architecturally complex (than the modular principle)[27], more evolutionarily recent, more adaptively effective, and a feature particular to the higher species.

[26] Here I draw extensively from Spivak's (1974) account of Derrida's analysis of the structure 'preface-text'.
[27] In the more nuanced language of the 1990 article; the interactive principle is superior to the modular principle since it enables and accommodates greater complexity. The interactive principle would also, more

In addition to the above there is another hierarchical assertion; that of symmetry over asymmetry. Goldberg (1990) points out that '[s]uperimposed upon the basic symmetrical gradiental structure are hemispheric elaborations' (p. 251). That is, the cognitive gradient is more fundamental than the secondary elaboration of hemispheric asymmetry or differentiation; the hemispheric symmetry of the horizontal (the cognitive gradient) and the vertical (the primary, secondary, and tertiary cortices) are primary in relation to the asymmetry of the 'fundamental dichotomies' (that is, the anterior motor and posterior sensory units and, especially, the left and right hemispheres), which can be understood as expansions, additions, embellishments, or supplements (Goldberg, 1990, p. 229). To 'superimpose' is to overlay, to cover up, a more primary level of organisation. Goldberg thus renders the brain a palimpsest.

The above distinction is however troubled in several ways: First, asymmetry is already present in Goldberg's description of the gradients from the first instant. In fact, it precedes his gradient articulation; first, in that he draws the distinction between the frontal (motor) and posterior (perceptual) parts to structure his unpacking of the various gradients, and, second, he is obliged to focus on the left hemisphere and its functional particularities, to justify the very existence of his gradients. The 'fundamental dichotomy' further disrupts the gradient notion since the frontal lobe only allows for a 'partial gradient'. Second, as Cilliers (1998) points out, asymmetry is an essential aspect of complex systems so that, for example, the origin (developmentally) of such systems need to be marked by asymmetry to enable the self-organisational process, otherwise the system remains in stasis. Since, Goldberg aligns himself with complexity theory, regarding the brain as an example of a complex system, and continuously draws from this theory either overtly or more subtly; this privileging of symmetry is contradictory.

Third, as Goldberg himself points out, the 'superimposition' of hemispheric difference, of asymmetry, is essential for the emergence of function (cognition). Without such a 'superimposition', there can be no identity, no brain as such, there would be no living body

---

plausibly, be reconciled with the continuous (as opposed to mosaic) and emergent (as opposed to prededicated) principles.

(something *in* the world, functioning). Thus this asymmetrical secondary imposition, this supplementation of symmetry, lies at the heart of the living brain. If the cognitive gradient is fundamental then it is a dead foundation, a cemetery, marked by stasis. It is in the *simultaneous* presence (as Goldberg himself acknowledges) of these vertical (hierarchical), horizontal (gradiental) and dichotomous architectures, in the play of the differences that they introduce in their co-presence that the living brain (a functional materiality) emerges. Talk of foundations in such a system is a violent imposition of explanatory utility, an ironic moment as the revolutionary notion of the gradient becomes the brain's 'philosophy'. Although Goldberg indicates that he is using his emphasis on the gradiental as an explanatory device, his continuous reiteration of its fundamentality, suggests a search for grounds in a system where any distinction or foundation is always contingent, provisional, and violent.

INTIMACIES

In the final section of this chapter I turn to consider the presence of three binaries in Goldberg's text: First, that of the mind/body (cognitive/physical) opposition, a distinction overtly countered by Goldberg. The covert return of such a Cartesian binary therefore demands analysis. Second, the social/biological distinction, a binary quite overtly used on numerous occasions in the text, this in the same book where the intimate entwining of social process ('civilisation') with the neural architecture of the frontal lobes is considered, demonstrated and supported. Again, this is a contradiction (or, rather, 'undecidable moment') which requires a closer look. Finally, I turn to Goldberg's work on 'male and female cognitive styles' (p. 88) and 'cognitive gender differences' (p. 93), in particular the function of the sex/gender binary in this discussion. Here I am interested in 'the slide' in the text between sex and gender; 'from biological terminology (men, women) to psychological terminology (feminine, masculine)' (Gatens, 1991, p. 147) and how this 'slide' speaks back to attempts to impose a divide between the (primal) biological and (secondary) social.

The above investigations can only be of interest in a (con)text where a set of profound intimacies are articulated: First, between materiality and function (cognition), as demonstrated, for example, by the notion of spatial/functional isomorphism. Second, as already mentioned, by the relation between the neural and environmental, as demonstrated by the emergent properties of, especially, the heteromodal associative cortex, and the 'sedimentation' (as distinct from 'mirroring', 'representation' or 'internalisation') of environmental 'invariants' as indicated in the so-called 'cognitive primitives'; the primary cortices (Goldberg, 1990, p. 268).

Mind and brain: Cartesian dualism and neuroreductionism

On more than one occasion during *The executive brain* Goldberg overtly distances himself from Cartesian dualism. He refers, for example, to the 'old Cartesian distinction between the body and the soul, which had fooled the general public for so many years…' (pp. 113-114). Later he indicates that 'the educated public understand today that cognition is a function of the brain' but that unfortunately 'Cartesian dualism is alive and well when it comes to everyday encounters with brain-damaged people' (p. 155). Thus, despite the ignorance and prejudice of the non-educated public, '"Descartes' error", to use Antonio Damasio's elegant phrase, is finally being corrected' (p. 114) as 'the distinction between "physical" and "mental" ailments is becoming increasingly obsolete' (p. 199).

The alternative to such dualism is now in its ascendancy: 'Today most people understand that the "mind" is a function of the brain, which is very much part of the "body"' (p. 199). This quote is Goldberg's first and only acknowledgement of the body; it is never developed further nor is the nature of 'very much part of' articulated, nor is the mind's relationship to the '"body"' specified. What is clear is that the mental/physical (mind/body) distinction is regarded as problematic. Instead 'mind' is a 'function' of the 'brain' and 'brain processes are mental processes' (p. 206). With this conflation of the mental and the brain, the cognitive and neural, the materialist move from Cartesian dualism, the mind is reduced to this organ. The role of the '"body"' in the emergence of '"mind"', unlike in Damasio's work, including the meaning of the placement of the term in inverted commas, is left unspecified.

As with Damasio, Goldberg shares a love for the ideas of Spinoza, indicating that he 'did not believe in the duality of spirit and matter' (p. 228)[28]. However what emerges in his text, in contrast to Spinoza's notion of mind and body being simultaneous 'dimensions' of the same 'substance', is a reduction where objective materiality is primary; a privileging of the extension of mind rather than the mind of extension. The emphasis on mind as brain function (where the brain, it should be noted, is only part of the central nervous system, which is itself only part of the nervous system) rather than, at least, of the body in general, still bears the image of a disembodied brain (Damasio's 'brain in a vat') and the risk of re-importing Cartesian dualism and neuroreductionism. When Goldberg says that the 'distinction between the "diseases of the brain" and "diseases of the soul" is becoming increasingly blurred', and that these are 'understood increasingly as the diseases of the brain' (p. 114), two comments seem necessary: i) Here we have neuroreductionism at work; it is not that *the role* of the brain in such phenomena is now being recognised but that it now forms *the whole* of the explanation[29]. ii) The reference to Damasio's book title in this context suggests a simplistic reading of his work; as we discussed in the previous chapter Damasio does not reduce things to the brain but describes an intimate relationship between the mind, brain, body and environment.

Aside from this reduction of mind to brain, we can still find the covert presence of Descartes' ghost in Goldberg's text: In his section on cognitive enhancement, Goldberg points out that in 'an "information age"', the 'relative importance of brain versus brawn has been reversed over the centuries and today success hinges more on brain than brawn.' (p. 200). Later he states:

> As we move into the twenty-first century and beyond, the attributes of social attractiveness will reflect the prerequisites of success in an increasingly information-driven society. Sharp will be beautiful. Being perceived as "dumb" will be even more socially damning than being perceived as "ugly". In this social

[28] See Chapter 2.

[29] Also see discussion on reductionism in LeDoux's work in Chapter 7.

> context, any credible approach to the preservation of cognitive wellbeing will be met with a public sense of approval and agency. (p. 202)

Goldberg goes on to describe, via an analogy with physical exercise, how 'vigorous and diversified mental exercise may help in the battle against the decline of mental functions' (p. 198), and how the field of cognitive rehabilitation has 'changed radically with the new evidence that cognitive exercise helps change *the brain itself*' (p. 204, emphases in original). There are indications that the diversity and intensity of interaction with the environment has real material (neural) consequence in the form of '"neuronal proliferation"', '"dendretic sprouting"', and '"vascularisation"' (p. 205). In contrast to the cognitive skill focus of earlier cognitive rehabilitation approaches, 'the new rationale' (p. 210) shifts focus from the disembodied cognitive subject to the neural body; from the cognitive subject as an information-processing unit to restructuring materiality itself via pharmaceuticals (biochemical level interventions) and exercises (body-subject level interventions). The intimacy between the mental and physical is thus acknowledged through new types of chemical intercession ('"cognotropic"' drugs) and reconceptualised forms of subject intervention. Goldberg concludes: 'To protect the *whole brain* against the effects of diffuse degenerative disease, a *comprehensive cognitive fitness regimen* must be designed, engaging various parts of the brain in a balanced and scientifically grounded manner' (p. 212, emphases in original).

But, despite acknowledging this intimacy between the cognitive and neural, we also have the positing of an equation (the placing on the same level) in the distinction between 'brain' and 'brawn': Previously 'brawn' (brute force, physique, body, strength, power, muscle) dominated 'brain' (intelligence, mind, intellect, reason) as a socially privileged capacity, but now, in the 'information age', in a moment of reversal, brain dominates brawn and has become the sought after capacity. The notion of brain versus brawn re-introduces a mind/body distinction in the form of a cognition/physical binary. Brain, the visible object emblem of cognition, is cast as superior to body, the latter equated with physical exertion, the display of strength. As mentioned in the previous chapter, Wilson (1998) recognises in neuroreductionism a contemporary Cartesian dualism, where the reduction of mind to brain

is a residue of the Cartesian split; the brain now takes on the role of a material substitute for the mind, which retains the body as an unarticulated elsewhere[30] and thus keeps the mind/body distinction intact.

However, the brain, as Goldberg puts it, is 'very much part of the body' (p. 199), that is, it is a subset of the body. It follows then that 'cognition' (equated to brain) is a subset of 'brawn', a capacity within a more general set of capacities, powers or enablements. 'Brawn' then becomes reinscribed, or redeployed, beyond its specific use as muscle strength, actual direct engagement with the environment or other, to a more general collection of abilities used to engage with the environment. Therefore, being surprised to find that research indicates that cognition, as a set of brain-associated capacities, is open to the same set of general physical development strategies (characterised by the principles of repetition, programme variation, consistency, exertion, regular rest, task specificity, and programme generality) as other bodily capacities, seems odd and can only be understood as a continued adherence to a Cartesian metaphysics.

The 'new evidence' undermines a cognition/mind/brain and body distinction, as a profound intimacy between these notions is demonstrated. What this suggests is that the physical exercise analogy is perhaps not an analogy after all. Derrida's comment on Freud's analogy between the psyche and writing is useful here; Derrida remarks that such a resemblance being possible suggests a profound relationship between the structures of language and the psyche, in that they both point to the limits of consciousness ('mnemic spontaneity') (Clark, 2000, p. 241). Similarly, the continued distinction between cognitive and physical exercise in Goldberg's text is a Cartesian residue where the same text reveals a resemblance between these forms of intervention that exceeds the limits of analogy and points to a fundamental unity, one more true to Spinoza's monism.

Society and biology

As already discussed, Goldberg articulates an intimate relationship between the (socio-cultural) environment (specifically referring to the experience of the individual) and the

[30] Also a dumb elsewhere, in both senses of the word.

neocortical 'sheet', be this the anterior (the prefrontal cortex) or the posterior (the inferior parietal cortex) heteromodal associative cortices. Thus, the prefrontal cortices are not only associated with working memory (dorsolateral prefrontal cortex) and inhibitory (orbital prefrontal cortex) capacities that allow for planning and delayed self-gratification, but are also described as being sculptured through the 'internalisation' of the extra-neural (cultural and moral practices and codes) through processes of self-organisation typical of cortices with a gradient (continuous, interactive, emergent) architecture. Here then we have a process of inscription comparable to the moulding of corporeality described by various critical social theorists[31], albeit with a focus on the prefrontal lobes and a notable silence with regard to the occurrence of such processes in and with the body in general. It does, however, reflect a departure from the stereotypical characterisation of neuroscience as adhering to biological essentialism and genetic pre-determination. Instead Goldberg sketches, especially in his 1990 article, a being embedded in its environment in that its neural architecture shows a organisation contingent on its immediate and historical experiences; a 'resultant' organism due to an 'emergent' neural architecture (p. 267). The neocortex is thus not only marked by the invariant (prededicated) primary cortices (the trans-individual zones), providing a degree of neural constraint to individual variation, but a more variable (plastic) associative cortex which reflects the complexity of the more immediate environment. Trans-individual invariance in heteromodal functionality, as articulated in brain-behaviour textbooks, is then an indication, not of genetic predetermination, but of 'environmental invariants'; the mature individual being 'a product of statistically prevalent cultural and experiential circumstances' (p. 267). Although Goldberg then indicates that 'there is no such thing as a single pattern of child functional neocortical organisation', his reasoning also indicates the possibility of remarkable variation in adult functional neocortical organisation, especially for those exposed to more marginal 'cultural and experiential circumstances' (p. 267). This he acknowledges in his discussion of the frontal lobes, where he notes that 'individual variation of human brain morphology is particularly pronounced in the frontal lobes' (p. 104). Despite this intimacy, Goldberg still imposes a strong distinction between the social and biological, a separation that, as I will demonstrate, is sullied in the very moment that it is made.

[31] See Chapter 3.

Some of the most powerful parts of Goldberg's book are his case studies in which he describes his experiences with various patients. One such study is that of a young man, 'Toby', which Goldberg uses to illustrate hyperactivity and attention deficit disorders. He describes in touching detail the life of an exceptionally bright individual who is a 'textbook' case of 'orbitofrontal dysfunction' showing 'poor planning and foresight' and 'diminished impulse control and exaggerated affective volatility' (p. 179). Toby's life story is dramatic; an 'obviously unwanted product of a date rape'[32], he leaves his foster home at age nine and spends the next decade as a 'street urchin', a 'child "sex worker"' and drug abuser before returning home and trying to settle into various trades and relationships (p. 174). Despite incredible ability he easily becomes distracted whilst his personal relationships are described as 'volatile and tumultuous' (p. 176). Goldberg comments that it is 'not uncommon for people with various biochemical imbalances to self-medicate, usually with self-defeating results' but that, for Toby, 'with successful treatment, these symptoms disappeared, or at least receded, in concert' (p. 179). He is referring here to Toby's prescribed use of Dexedrine, which '*somehow* helped to strengthen the fragile frontal lobes', specifically the 'fragile frontal lobe connections to other parts of the brain' (p. 179, emphasis added). Toby however stops this medication, due to its side effects, and joins a support group and enters supportive psychotherapy. Goldberg comments that Toby 'feels that finally understanding his condition gives him strength over it, and that he is, on the whole, a much happier man' (p. 179). The study ends as follows:

> Toby's life continues to be a struggle, stretches of success interspersed with painful reversals. The problem has not disappeared but he has learned how to manage it, at least to a degree. The knowledge that his problem is biochemical helps Toby cope with it and removes the guilt and the shame. He no longer perceives it as a personal failure of character, but merely as a medical condition. Toby has learned to cope and prevail. (pp. 179-180)

[32] Why this is 'obvious' is not clear.

Thus if the problem is of the body, even if this is of the brain, then this is not of the self[33]. It is then beyond agency and hence does not justify the experience of negative social emotions such as guilt and shame. Furthermore, Toby no longer interprets his condition as a failure of character. A judgement about one's character is, of course, an inherently socially-embedded act, and having removed the problem from the social, the problem becomes 'merely' medical.

The above re-introduces a Cartesian split, that between materiality and mind, as well as a distinction between the biological and social. The biochemical is removed from the psychological and the social, despite the existence of an imbalance being determined through the psychological and social. The possible biological consequences of Toby's experience of 'unwantedness' and of his childhood and adolescent sexual exploitation are not overtly mentioned (p. 174). This silence is in a (con)text where an intimacy between experience and neural organisation is advocated, where Allan Schore's 'provocative hypothesis' about the effects of 'early mother-infant interaction' on orbitofrontal development is treated with some excitement (p. 141), and where it is acknowledged that attention problems may be acquired early in life. In such a context the absence of an overt reference to the aetiology of Toby's propensities is striking. Instead we are left with a silence that re-inserts traditional distinctions. Although Goldberg wonders about the effects of a street life on his substance use, the drug addiction is regarded as self-medication for a biochemical condition and is divorced from the social context in which Toby survived and emerged. That chemical intervention was ultimately rejected by Toby in favour of social resources (psychotherapy and support groups) is also not commented on.

Is it not possible to *both* suffer structural-biochemical neural consequences from one's social events and experiences *and* not be obliged to suffer shame and guilt? That is, to admit an intimate relationship between neural and environmental events that is open to multiple interpretations and psychological consequences? Furthermore, and this is where assertions of discrete chemical aetiology come undone in their moment of being made, is making sense of a problem in this way, as a biochemical disorder, not a discursive, and

[33] This despite, as indicated at the start of this chapter, Goldberg equating the frontal lobes to the self.

therefore, social act? In other words, attempts to locate the problem purely in the 'physical', claims to such 'knowledge', are always social acts; discursive and interpersonal actions which simultaneously undermine the content or act the statement is trying to perform. To locate something as in or of the body, even if only in thought, is to already be beyond the claim. And to think or say such a thing is to already act through, with and on one's neural architecture and body at large. Attempts at locating problems within biological/social or biological/psychological distinctions are only possible through the social and the biological and thus such attempts are undone in the moment they are enacted. We are folded undecidably both into the biological and the social.

Gender and sex

'Are the gender differences in decision-making styles biologically or culturally determined to begin with?' (p. 92). When Goldberg asks a question like this we can conclude several things: i) That he uses the term 'gender' in a non-specific fashion, that is, as a synonym for 'sex'. In other words, he is not following the traditional biological/social distinction referred to by egalitarian feminists where 'sex' is stable and biological and 'gender' is contingent and social (Grosz, 1990). ii) That he draws a clear distinction between the biological and the cultural, where the former must then be genetic and outside of culture and the latter social and outside of the corporeal. Decision making 'styles' must then be 'determined' by one of these. iii) That the asking of such a question, in a con(text) where decision making is associated with the prefrontal lobes and where these lobes are considered to consist of an emergent cortical architecture, and are thus open to social influence, represents an illogical moment.

It also becomes clear that when Goldberg investigates this question and spends a fair amount of time delineating the frontal lobes' 'morphological gender differences and asymmetries' that he is not interested here in whether certain behaviours are considered 'feminine' or 'masculine' (in fact, he never uses these terms) but that he is trying to tie particular cognitive styles to particular bodies with a particular 'genital morphology' (Grosz, 1990, p. 334), that is, he is directly linking cognition to 'sex'. He then goes on to claim that males display a context-dependent (CD) style of decision making and women a

context-independent (CI) style, and that these differences are 'both robust and significant' (p. 89). CD refers to a style which bases its choice on contingent aspects of the situation whilst CI refers to a more principle-led ('universal default strategy') form of decision making (p. 91). Goldberg points out that '[n]either strategy is better than the other in an absolute sense' (p. 92) but that CI works better in a more stable environment and where 'an individual's grasp on the situation is shaky' (p. 92). Females are thus attributed a style which works best in stable climes where a good understanding of the complex or unfamiliar situation is not necessary. The sexist overtones of such a characterisation are obvious but rather than abandon the reading at this point, casting the text into the slop bucket of patriarchal propaganda, this temptation is resisted and the argument pursued further.

The interesting point about this claim of a 'robust and significant' linkage between a 'cognitive style' and a particular sex is how it is softened: Goldberg indicates that, in the experiment in question, 'males were *more* context dependent and females were *more* context independent', indicating that we do not have a perfect one style to one sex fit here (p. 89, emphases added). Later he points out that 'in *subtle* ways individuals tend to gravitate toward one or the other approach' and that 'females as a group have a *subtle* preference toward context-independence and males toward context-dependence' (p. 92, emphases added). Also '*very few* people adhere to one or other strategy in its pure form; *most* people are able to switch between them at will, or to adopt mixed strategies' (p. 92, emphases added). In fact, rigid adherence to one style is associated with frontal lobe pathology. Having said this, to then later say that 'male and female cognitive decision-making strategies are different' seems a rather simplistic insertion of a male/female binary on a rather more complex phenomenon (p. 96).

However, how can we make sense of this absence of a one style on one sex match? We could say that we are dealing here with a gender based practice, that is, that females are encouraged to engage in the more feminine form of CI decision making. Being thus socially determined the presence of both styles across both sexes would be understandable. This is then a typical imposition of a sex/gender binary where the biological is left as static and variation is socially determined. But as mentioned, Goldberg is doing something more

than this, he is trying to align cognition to morphology, to indicate that there is a 'more or less direct relationship between structure and function' (pp. 97-98). In terms of certain feminist readings this would be an exercise in essentialism, biologism and universalism (Grosz, 1990). The accusation would be that with such a set of conceptual commitments, Goldberg is attempting to 'rationalise and neutralise the prevailing sexual division of social roles by assuming that these are the only, or the best, possibilities, given the confines of the nature, essence or biology of the two sexes' (Grosz, 1990, p. 335). It is, as I indicated in the first part of this chapter, not a claim that Goldberg would accept easily, rather countering that 'gender' difference is not necessarily an indicator of inferiority. But, as those supporting 'feminisms of difference' would argue, this is where the actual reality of a distinct male and female body steps in; the same behaviour expressed by both a male and female body have different significances (meanings, effects) since it is the female *body* that is considered inferior to the male body (Gatens, 1991; Grosz, 1990). So, different gendered behaviours will mean different things when expressed by differently sexed bodies. The difference of the sexed body makes a difference.

The above, although it acknowledges the social impact of actual physical difference, of course keeps the sex/gender binary aligned with the biological/social binary. The sexed body remains a stable entity with an asocial biology. It is here that I feel Goldberg's claims, his pursuit of cognitive/physical intimacy, can be pushed into service. In tying difference in cognitive styles to brain morphology he himself, as the opening quote indicates, exercises a biological/cultural distinction; brain variation if it cannot be cultural must then be genetic. But, following the rigours of science and its need to account for the presence of variation, we should ask: If it cannot be cultural then why is there no perfect match between style and sex, especially given the evidence of significant differences in brain morphology between the sexes? The response could be that we are not dealing here with such static and distinct sexual biologies, that if we accept a profound intimacy between cognition and neurology, the subtle variation in cognition across the sexes then indicates the subtle variation of sex itself. In other words, we are either dealing with significant variation within the two sexes (which is a conservative reading) or we are

touching on a phenomenon that indicates the violence of utilising a sexual binary where bodily morphology exceeds the constraints of two sexes.

Of interest here is Goldberg's argument and evidence that two distinctions – greater hemispheric lateralisation and frontal posterior integration in males and greater hemispheric integration and frontal and posterior differentiation in females – forms a distinguishing feature between the two sexes. He wonders about the effect such distinct architectures would have on the emergent functional properties of the cortex. Be that as it may, and I think it is a set of differences that 'feminists of difference' would also be interested in examining, there will always be (physical and functional) variation, even if the statistical results are 'robust and significant' (p. 89). To restate; if function and morphology are isomorphic and if the female brain and the male brain are distinct types, then why is there no perfect match between cognitive style and sex? This is either then because there is no clear link between function and morphology, this allowing an opening for the re-entry of disembodied notions of gender and Cartesian dualism, or the distinction between the brains is exaggerated. It is accounting for these stylistic differences (variation) in a context where cognitive and neural (mind and body) isomorphism and social and corporeal intimacy (due, in part, to an emergent cortical architecture) is taken seriously that the sexual variation of the body will be revealed. A variation in cognitive styles then suggests a variation in neural morphology, a variation in neural morphology suggests that a binary sex model is inadequate and that variation in environment seems to be linked to variation in sex. Enforcing a distinction in a landscape of difference is a violent act; even if that landscape shows a bimodal (not binary) distribution (Wilson, 2004). Such a distribution reveals the vagueness of binary lines and the ideological nature of attempts to erase such subtleties.

However, impositions of pure difference are equally violent in such a landscape. Wilson (2004) makes a similar argument to the above in her reading of Simon LeVay's well known research in which he claims the existence of significant and distinguishing hypothalamic nuclei size[34] differences between male homosexuals and heterosexuals. She notes a 'fair

[34] LeVay specifically refers to the third interstitial nuclei of the anterior hypothalamus (INAH 3) (Wilson, 2004).

degree of variation' in his data (p. 53) where the data *both* clusters in a dimorphic (hetero/homo) pattern *and* produces measurements that trouble such a patterning. Wilson notes the extensive and diverse critique of this research and particularly wishes to resist the call by some critics to oppose what is seen as the statistical (and ideological) imposition of a dimorphic pattern on a complex landscape more accurately typified by a 'distributed logic' (p. 54). In other words, 'the logic of the range is offered in order to replace or invalidate the logic of the divide' (p. 56). Instead, she argues for a logic that is neither that of the discrete (the binary) nor an 'aimless pattern', but rather 'a reticulating pattern, a co-implication of the disseminated (ranging) with the dimorphic (divided)' (p. 56). Here neither pattern is excluded but are understood as being in a complex generative and constraining relationship with one another. This enables the acknowledgement of the troubling and insistent presence of both, not as the interaction between two discrete positive phenomena but, drawing on Michael Forman, a relationship of the chiasmus where the two are 'joined in sameness while separated in difference (cited in Wilson, 2004, p. 58). Thus LeVay's and Goldberg's data neither unproblematically accommodate the simplicity of the binary nor the critical dream of absolute difference, but produce a dimorphic pattern marked by variation that relentlessly speaks back to both impositions. Schyfter (2007) suggests that Wilson's reading indicates that neurology provides us with 'both a limitless and constrained range of possibilities for sexuality' (p. 351). Here I hope that my reading of Goldberg provides a similar complexity for sex.

SYNOPSIS

The betwixt status of both Goldberg as person and professional and of *The executive brain* as text resonates with an 'ambiguity' that characterises his conceptualisation about the brain. Grosz (1990) writes of the 'difference between difference and distinction' (p. 344), where the latter refers to 'negative, binary, or oppositional structures within which only one of the two terms has any autonomy; the other is defined only by the negation of the first' (p. 339). This is, of course, Derrida's metaphysics of presence, a logocentric and finite discourse that, as Hurst (2004) points out, we are obliged to (cautiously) negotiate. In Goldberg's text we then, to quote Spivak (1974), again find that '[h]umankind's common

desire is for a stable centre, and for the assurance of mastery – through knowing and possessing' (p. xi). This desire, as demonstrated in Chapter 2, also lies at the heart of neuroscience in general. The current chapter has attempted to illustrate through a deconstructive reading how such efforts at establishing clear distinctions are always simultaneously undone in the moment in which they are enacted; that attempts at establishing autonomy and presence are always in need of supplementation.

For Goldberg there seems to lie in the frontal lobes the hope for centre and closure, nexus and circle, crown and foundation. But the attempts to establish the frontal lobes as presence, as locality, of the core or self, is an effort which requires the supplementation of the rest of the brain so as to establish itself. The frontal lobes are both agent and instrument, centre and periphery, proactive and reactive, active and passive, constraining and constrained, controlling and controlled, autonomous and supplemented, hierarchical and uniform, one and two. Any attribution to these structures of notions of control, agency or intentionality, is based on a structure that simultaneously enables and undoes such claims. There is a remarkable similarity in the relationship between the frontal lobes and the rest of the brain and the relationship between the economic and aneconomic processes of *différance* as described by Hurst (2004). Any control is established on the basis of a reduction, an imposition both necessary and fictitious, of and on a ground *sous rature*.

More broadly, the functionality of the brain as a whole, its identity, emerges through the play of difference of various dimensions of cortical organisation, all emerging from the 'standardisation' of the neural net. Broader still, there are ultimately no parallel processes; only distinctions that once read closely reveal a relationship that is intimately entwined and undecidable. The cognitive and the neural, the social and the biological, fold into one another, each enabling the specification of the other in the very moment that such articulations are undone.

CHAPTER 7
LeDOUX'S UNCONSCIOUS

INTRODUCTION

In her book, *Psychosomatic: Feminism and the neurological body* (2004), Elizabeth Wilson states that 'close attention to neurological detail need not be at the expense of critical innovation or political efficacy' (p. 16). As discussed in Chapter 3, the engagement by critical psychology and associated approaches with 'this (biological) body' (Wilson, 1998, p. 53) has tended to be one of dogmatic caricaturing and vivid exclusion, or of use as theoretical supplement, or simply absent. Referring to feminism's tendency to consider neurological theories precarious and essentially an oppressive discursive regime, Wilson highlights the operation of the social/biological binary operative in this critical school where 'the final word… must always lie in the domain of social and cultural analysis' (p. 16). Against such a backdrop her claim (which is the same assertion made in this thesis) is provocative; emancipatory and theoretical advances may well be found in the typically reductionist hinterland of neuroscience.

In a chapter in which she juxtaposes Freud's model of neurasthenia and Kramer's kindling model of depression, Wilson (2004) argues that for both of these theorists 'their critical sensibilities are animated and amplified by neurological detail' (p. 27). And it is through such careful attention to specificities that 'the unavoidable, unsettling, difficult to resolve character of neurology is articulated…' (p. 27). What is revealed is a materiality with tendencies that are difficult to reconcile with deterministic models of neural activity. Thus an understanding of the intricacies of neural-functional intimacy undermines determinist readings of the biological, both by those on the outside and inside of the field. It is an engagement that promises to challenge and transform dominant readings by both the social and neural sciences.

Given this faith in the utility of close examinations of minutiae, it seems useful to follow suit within the confines of this project by paying attention to the intricate concern with the micro-particulars of neural processes articulated by Joseph LeDoux in his book, *Synaptic*

self: How our brains become who we are (2002). Unlike Damasio and Goldberg, who make reference to neural structures, gross circuits and the effects of neurochemicals, LeDoux, who is exclusively a researcher, engages with neurochemistry and the micro-details of various neural circuits directly, such specifications forming the major part of his text. This concern with specificities is not a directionless obsession, for it is through such attention that LeDoux builds his justification for his 'bottom-line point': '"You are your synapses"' (p. ix). His ambition is then to provide 'a synaptic explanation of the self' (p. ix).

In this chapter I explore the possibilities LeDoux's micro-attention opens up for critical understandings of the (neural) body. As with the previous two chapters, this is not a mere description of the text (if there could be such a thing) but a critical reading, one marked by the 'loving movement' which Kamuf (2000) points out 'is the indispensable key to what deconstruction is' (p. 151). Also in line with the preceding chapters, this one opens with a brief introduction to LeDoux himself and an outline of the structure and main points of the text. The rest of the chapter in then comprised of three sections: The first deals with the nature of the reductionism present in LeDoux's book including a reading of what he calls the 'credibility problem' (p. 201). Next I consider the nature of neural materiality as detailed in the book, focussing on the notions of epigenesis, exuberance and context, and the reading of the corporeal this enables. Then in the final section I consider the implicit/explicit binary and the concern with coherence as developed in the text. A synopsis closes the chapter.

LeDOUX AND *SYNAPTIC SELF*

As with Damasio and Goldberg, Joseph LeDoux occupies a prominent place in the institutionalised discipline of neuroscience. As the biography on the webpage of the LeDoux Laboratory indicates, he is a University Professor and Henry and Lucy Moses Professor of Science at the Centre for Neural Science (where his laboratory is located) and the Department of Psychology of New York University (NYU). He is also Director of the Centre for the Neuroscience of Fear and Anxiety, a research centre established by the US

National Institute of Mental Health. His doctorate was in Psychology and he worked at the Department of Neurology at Cornell University Medical College before joining NYU. Furthermore, he is a Fellow of the American Association for the Advancement of Science, Fellow of the New York Academy of Science, a Fellow of the American Academy of Arts and Sciences, and in 2005 received the Fyssen International Prize in Cognitive Science. As with Damasio and Goldberg, LeDoux works in the US but, unlike them, appears to be an American born and bred.

LeDoux indicates on the website of the Centre of Neural Science that his laboratory's research is 'aimed at understanding the biological mechanisms of emotional memory' with a particular interest in 'how the brain learns and stores information about danger'[35]. Central to this is the mapping of neural pathways (circuits), specifically those involving the amygdala, the central neural structure in LeDoux's research and, as we will see, his theoretical work. He has published widely in numerous prestigious journals but became known beyond the confines of neuroscience with the publication in 1996 of *The emotional brain: The mysterious underpinnings of emotional life*. Along with Damasio's *Descartes' error* (1994) and Panksepp's *Affective neuroscience* (1998) this book sedimented the 'turn to affect' in cognitive neuroscience[36].

It is *The emotional brain* which is referred to in Bennett and Hacker's (2003) critical analysis of logic in the neurosciences, the celebrated *Philosophical foundations of neuroscience*, where LeDoux's work is considered alongside that of Damasio, Edelman, Gazzaniga, Kandel and other prominent neuroscientists. But this text has also been referred to by those in the social sciences, specifically those concerned with embodiment, such as Cromby (2007) and Wilson (2004). Wilson in particular engages with LeDoux's ideas as expressed in *The emotional brain* in terms of the promise they hold for 'feminists to work

[35] Already here, in the opening statements of a website page, an issue becomes visible; the idea that a brain 'learns' and 'stores', what Bennett and Hacker would see as indications of a mereological fallacy (see Chapters 2 and 5), a point I touch on again later in this chapter.

[36] Several recent 'turns' may be identified in the neurosciences: Damasio (1994) and Goldberg's (2001) texts (both considered in this thesis) indicate the 'turn to the frontal lobes' in late twentieth century neuroscience, whilst LeDoux (1996, 2002) and Panksepp's (1998) texts reveal a contemporary 'turn to the unconscious'. It is this latter theme, specifically in LeDoux's 2002 book, that will be considered in this chapter.

much more productively with neurological and evolutionary data' (p. 94). Her reading of this book will be referred to later in the chapter but for now acknowledging her work with *The emotional brain* provides a partial justification for me to rather engage with LeDoux's subsequent book, *Synaptic self: How our brains become who we are*, published in 2002. Less overtly celebrated than its predecessor, *Synaptic self* is broader in scope and has been acknowledged as a significant text by Damasio, Schacter, and Gardner, amongst others. It is thus a useful nexus where to closely read the work of the 'proper name' LeDoux.

Comparing the books discussed in this '(Mis)readings' section, LeDoux spends the least amount of time and space explicitly reflecting on his text as text. He simply states in a paragraph in 'Acknowledgements' that this is 'not a pop psychology, how-to, or self-help book' and that although writing a text that is 'clear to lay readers and at the same time not insulting to other scientists is tough, I'm pleased with the result' (p. ix). Thus he claims success in writing an in-between text, though his discourse is notable for its detail and terminology both in terms of neurochemical processes and historical detail. He carefully traces the intricacies of neural dynamics and structures as well as the development of these understandings. In a way LeDoux's text reads like a history book, although it is then a celebratory historiography which provides an account of his discipline's progress towards truth, that is, it is an optimistic progress report (Richards, 2002).

In broad strokes: The book opens with an introductory chapter where the main themes of the text are indicated, the primary thesis being that the 'essence of who you are, reflects patterns of interconnectivity between neurons in your brain' (p. 2). The notion of self is explored and defined in the next chapter after which the focus is clearly on the neural; across the next four chapters, brain structure and function, brain development, memory, and the intricacies of synaptic connectivity are considered. This is followed by three chapters on the 'mental trilogy' (p. 174); cognition, emotion and motivation respectively. The penultimate chapter deals with the biology and treatment of the three primary 'psychopathologies'; psychosis, depression and anxiety, while in the final chapter LeDoux indicates that it is 'time to bite the bullet and explain how I think the brain, specifically the synapses, makes us who we are' (p. 301). He summarises his position through the

delineation of seven principles. Since this provides a good synopsis of, and orientation to, LeDoux's primary ideas and notions, I will outline these principles here.

LeDoux's first principle ('Different systems experience the same world') states that, although 'different neural systems have different functions, because they are part of the same brain they will be involved in encoding the same life events' (p. 308). The brain, consisting of a multiplicity of functionally and physically distinct neural structures, by being embedded in the same environment and acting synchronously and in parallel, 'learn' and 'store' 'different aspects of a single experience' (p. 308). Significantly, LeDoux indicates that as a 'result of parallel encoding by, and parallel plasticity [learning capacity] within, neural systems, *a shared culture* develops and persists among the systems, even if they never communicate directly' (p. 310, emphases added). That is, a consistency is enabled across structures due to the 'encoding' of an external structure; a shared identity emerges that exceeds genetically determined morphological and procedural similarities.

The next four principles are all concerned with synaptic plasticity (malleability) and the co-ordination and integration of activity across neural cells, circuits and systems. The second principle ('Synchrony coordinates parallel plasticity') underscores temporality and refers to neuronal synchrony, the simultaneous firing (activity) of various neurons, and its possible contribution to the solution of '*the binding problem*', that is, that 'in order to have a conscious perception of the stimulus as a whole object, rather than as a collection of features, the elements have to be bound together' (p. 193, emphases in original). Here the theme of material-functional intimacy becomes apparent in that what are bound together by such synchronous activity are circuits; experiential unity and material cohesion are indistinct (not causal). This binding of simultaneously active synapses is enabled by Hebbian plasticity, a central notion in LeDoux's work, which colloquially stated refers to the idea that '"[c]ells that fire together wire together"' (p. 79) or, more formally, as Hebb's rule; that concurrent activity in presynaptic and postsynaptic cells results in the strengthening of the connection between those cells. A 'strengthened' connection refers to the synaptic chemistry of those active elements being altered in such a way that future presynaptic activity increases the possibility of a postsynaptic action potential, that is,

intercellular communication is more likely: 'Hebbian plasticity thus binds simultaneously active cells together so that the next time the same or similar stimulus occurs, the same cells and connections will be activated' (p. 310).

Whereas the second principle emphasises a synchronous aspect, the third ('Parallel plasticity is also coordinated by modulatory systems') highlights a diachronic dimension. Modulators are a diverse collection of neurotransmitters (including peptides, monoamines, hormones, and opiates) that are contrasted with the primary excitatory and inhibitory neurotransmitters, glutamate and gamma-aminobutyric acid (GABA) respectively, in that the former act in a more global, slower and longer-lasting manner[37]. Here LeDoux emphasises the monoamines (acetylcholine, dopamine, epinephrine, norepinephrine, and serotonin), which are chemicals that are produced in a variety of brainstem groups and tend to mediate the effects of the primary neurotransmitters. As indicated, their effect is widespread but is specifically felt at 'synapses that are already active when the modulator arrives' (p. 313). One effect of many of these molecules (since not all of them enhance synaptic malleability) is to facilitate synaptic plasticity 'allowing the whole experience to be stored at once, albeit across multiple systems' (p. 315).

The fourth principle ('Convergence zones integrate parallel plasticity') stresses the spatial dimension in the establishment ('self-assembly') of 'the coherent personality of the human being' (p. 315). LeDoux identifies various regions in the brain (the posterior parietal cortices, rhinal cortical areas, hippocampi, and prefrontal cortices) as convergence zones, 'where information from diverse systems can be integrated' (p. 315). The convergence of neural activity has consequences for plasticity:

> When plasticity occurs simultaneously in two regions that feed into a convergence zone, plasticity is also likely to occur in the convergence zone since it will be the recipient of the high level of activity that occurs when plasticity is being established

[37] LeDoux does point out that 'sometimes, the distinction is murky' between modulators and primary neurotransmitters (p. 56). This is in part due to the identity of an element depending on its place in the system, that is, its context. This point will be addressed again later in the chapter.

> in the individual zones, further increasing their potential to integrate information across systems (p. 317).

Convergence zones are contrasted with 'lower connections' with the former providing a 'kind of unity of experience' (integration) in contrast to the 'bits and pieces' of these other regions (p. 318).

Principle five ('Downwardly mobile thoughts coordinate parallel plasticity') refers to the efferent action of these convergent zones on the sites of their afferent connections. The 'more or less' automatic bottom-up assembling processes are distinguished from these top-down processes which can direct, enhance and suppress activity via 'downward causation' (p. 319). Referring expressly to working memory[38], which LeDoux equates to consciousness, thought is understood as a 'pattern of synaptic transmission within a network of brain cells…' (p. 319). This formulation again stresses material-functional intimacy; thought emerges from neural activity and there is thus no radical distinction between mind and materiality. Thought is capable of enhancing the plasticity of other networks and, since it is related to consciousness, this indicates the agency of the organism: 'the way we think about ourselves can have powerful influences on the way we are, and who we become' (p. 320).

The final two principles address two core notions in LeDoux's text; emotion and the distinction between implicit (unconscious) and explicit (conscious) systems. The sixth principle states a relation of power ('Emotional states monopolise brain resources') in that it is the emotions which 'play a key role in organising brain activity' (p. 320). These systems can activate brainstem modulatory systems and, in particular, the amygdala can influence cognition, specifically perception (the cortical sensory areas), thought (associated with the prefrontal cortices) and the formation of explicit memories (associated with the

[38] A notion used by both Damasio and Goldberg in the previous chapters, LeDoux defines the function broadly, indicating that working memory refers to both the temporary storage of information (short-term memory) and executive functions (the manipulation of on-line information). Where Damasio distinguishes between working memory and decision making, LeDoux differentiates between cognitive and emotional forms of working memory.

hippocampus and surroundings areas). In addition, there are more indirect forms of 'additional feedback to the brain'; the feeling of bodily sensations and the impact of hormones on neural activity (p. 320). The amygdala clearly takes on a dominant role similar to Goldberg's frontal lobe in that 'emotional arousal penetrates the brain widely, and perpetuates itself' (p. 320). The activation of emotional systems implies generally greater arousal which increases the possibility of coordinated learning across systems. Thus integration again features here: 'By coordinating parallel plasticity throughout the brain, emotional states promote the development and unification of the self' (p. 322).

Finally, principle seven ('Implicit and explicit aspects of the self overlap, but not completely') highlights one of the primary distinctions operative in the text; that between implicit and explicit systems. For LeDoux the 'self' should not be equated with consciousness but rather refers to the 'totality of the living organism', which 'subsumes the idea of personality' which is aligned with consciousness (p. 26). This totality would therefore include both implicit (unconscious) and explicit (conscious) aspects. This distinction then allows for the existence of schisms: 'Sometimes the things learned explicitly are not the things that were focussed on by the implicit systems…' (p. 322). Implicit and explicit systems are not aligned and can therefore stand in a relation of contradiction to each other. The dominance or influence of any system is always partial, temporary, and incomplete. This admission sets up a tension with the concern about integration and coherence expressed across the majority of the previous principles, an issue which will be discussed later in this chapter.

NEUROREDUCTIONISM AND THE 'CREDIBILITY PROBLEM'

The aporia of reduction

The neuroreductionist claim is that statements about mind or self are disposable in favour of statements about neural facts, that is, one may reduce psychology to neuroscience since no distinctive facts about mind or self exist; mental and self statements are made true purely by facts about the nervous system (Blackburn, 1994). So when LeDoux claims that 'the brain, specifically its synapses, makes us who we are' (p. 301) and 'my mind (and

yours) is the product of a physical system' (p. 327), we have here instances of reductionist statements; 'self is equal to the brain' and 'mind is equal to the nervous system', where the latter term in each equation is primary in that it explains the former. I have already touched on the theme of reductionism in Chapter 2, considering specifically the claims of Paul Churchland. In this chapter I consider LeDoux's explicit statements about reductionism, as well as instances of reductionism in his text. What becomes apparent is that LeDoux explicitly claims and performatively disclaims a reductionist position. It is argued that this contradictory position is both necessary and impossible; what I call the aporia of reduction.

Wilson (2004) indicates that, in contrast to the common feminist gesture of reducing the body to passivity and neurology to caricature, 'some biologically reductionist demands have the potential to expand our theories of the body in important, innovative, and sometimes exhilarating ways' (p. 3). For example, Wilson claims to find in Freud's early neurologically-inclined writing not accounts that are 'static, incoherent, or critically useless' but rather his 'most acute formulations about the nature of the body and the character of the psyche' (p. 3). She then asks: 'What new modes of embodiment become legible when biological reductionism is tolerated and explored?' (p. 3). This is a generic question across her work and, as was made clear in the opening chapter, a significant aspect of the objectives pursued in this particular project.

LeDoux's approach in his book, *The emotional brain*, is, according to Wilson (2004), 'unmistakably reductionist' (p. 92). However, she argues that one needs to push past this initial sense of incompatibility with critical agendas so as to reveal a formulation of the brain that 'allows feminists to work much more productively with neurological and evolutionary data' (p. 94). I will return to the content of her comments on this particular book in the final section of this chapter but, as indicated above, here I would like to engage more fully with LeDoux's reductionism, specifically as found in *Synaptic self*. Although, as Wilson states, LeDoux does engage in, and explicitly aligns with reductionism, he also, as I will try to demonstrate here, unavoidably exceeds the limits of such an alignment.

LeDoux discusses the issue of reductionism in an extensive endnote (pp. 327-328). Despite indicating here that 'I believe that my mind (and yours) is the product of a physical system', he states that he does not 'outright[ly] reject other ways of thinking about the mind' (p. 327). He differentiates between non-scientific (e.g., literature) and non-reductionist scientific (e.g., sociology) approaches which he indicates (reductionist) neuroscience should 'coexist with and complement' (p. 328). This complementary relationship is one where: i) neuroscience and social science both contribute to 'culture', ii) both provide helpful ideas about the mind, iii) neuroscience provides brain 'facts' to the social sciences helping them to better understand the world, and iv) the social sciences might provide 'discoveries' that will help neuroscience develop 'novel experiments'. What this brief list begins to demonstrate, I argue, is the impossibility of a pure reduction, that is, 'mind as brain' or 'self as synapse' equations, in that explaining the mind 'in terms of brain mechanisms' or 'the self in terms of synapses' (pp. 327-328) should, strictly speaking, leave no room for any of the contributions or collaborations indicated. The possibility of contribution on a serious level beyond diplomatic gestures ruptures any pure reductionist equation.

LeDoux's response to critiques of reductionism is inadequate; the disparaging treatment of reductionism is attributed to those 'outside [of] science' and is regarded as 'partly because people like to think of themselves in terms of their own self-awareness'. Thus the diversity of responses critical of the idea of mind as 'the product of a physical system' (i.e., the brain) are condensed to the discomfort of those who equate themselves (their selves) to consciousness[39]. Not mentioned is the tendency for neuroreductionism to result in autonomous and circumscribed notions of the individual (individualism), the reading of suffering as brain pathology, other apolitical and asocial readings of phenomena, and biological essentialism and determinism (Wilson, 2004). Trimming down and caricaturing reductionist critique to nostalgic valorisations of self-consciousness by non-scientists fails to address these concerns.

[39] As we will see this is a claim that LeDoux himself makes later in the same text.

The reductionist problematic will now be made explicit by considering some examples of the ways in which the biological/social binary operates across the text: LeDoux refers to Sir Frederic Bartlett's statement that the process of recollection is a process of construction[40], not simply a process of replaying an event in the mind's eye. He uses as example Bartlett's finding of how Western subjects recalling a foreign folktale would rewrite the story 'to the point where it resembled a more familiar Western narrative' (p. 177). LeDoux uses this to demonstrate how long-term memories may be used to guide thoughts and actions. What is however silently passed over here is the structuring of the recollected narrative by that which exceeds the neural, in this case, the cultural. So cognition, as an aspect of the 'tripartite amalgam' of mind (p. 174), is structured by the extra-neural. As such the mind cannot simply be equated to the brain since it exceeds this structure.

Shortly after stating that 'the self is synaptic' (p. 2), LeDoux comments:

> Many will surely counter that the self is psychological, social, moral, aesthetic, or spiritual, rather than neural in nature. My synaptic theory of self is not proposed as an alternative to these views. It is, rather, an attempt to portray *the way* the psychological, social, moral, aesthetic, or spiritual self is realised. (pp. 2-3, emphases added)

This is a rather different statement to the initial equation; what is indicated is that the neural is the *way* through which the self is realised, not that the self *is* synaptic. Thus, synaptic processes are a necessary (but insufficient) manner in which the constituents of the self are sedimented. Reading LeDoux's text makes this clear as what he articulates in detail again and again[41] are the molecular processes through which the extra-neural (signified as 'environment', 'stress', or 'stimulus') moulds the neural.

[40] The theme of reconstruction was explored in some detail (as presented in Damasio's *Descartes' error*) in Chapter 5.

[41] This claim will be substantiated in the remaining sections of this chapter.

Consider the following analogy used by LeDoux:

> Just as people living in different towns of a country who have never met face-to-face can share a culture because they have similar environmental influences (similar climate, similar geography, similar myths and legends, similar political histories, similar current political situation, similar social institutions), within the brain, a kind of shared culture develops between the various systems because they are exposed to similar environmental circumstances (p. 308).

This, of course, refers to his first principle discussed in the previous section. The gist is that internal identity emerges due to exposure to external consistency[42]. But this means that the identity of the brain is determined by the extra-neural and, since self and mind are equated to brain, that they are also determined by the extra-neural.

Several comments can now be made: i) LeDoux exceeds the parameters of his reductionist statement through the very arguments he uses to justify it. ii) The above may still be considered reductionist since, as *the* way, it excludes other means through which the self is sedimented. Others may refer to discourses, practices, spatial structuring, and technologies as some of the other routes through which a self is constrained and enabled. iii) This inverts the supposed biological/social binary where the former is primary and suggests that LeDoux is operating in a framework not unlike that articulated in some critical approaches to embodiment where it is the extra-neural which moulds (give form to) the corporeal[43]. LeDoux in this way may be read, despite his reductionist claims, to be specifying the micro-particulars of how the social penetrates the neural.

From the above we may conclude that not only does LeDoux go beyond the parameters of both of his two reductionist equations; that is, mind does not equal brain nor does the self equal synapse, but that he inverts the social/biological binary countering any simplistic claim of his work as an instance of neural foundationalism. Of course, this leaves the

[42] This is a point that Goldberg also makes. See Chapter 6.

[43] See Chapter 3.

binary unperturbed and a more complex reading (a displacement) is required. Such a reading requires a more detailed consideration of several other moments in the text which I tackle in the remaining sections of this chapter. For now I establish some grounds for this displacement by turning to another example.

During his review of different notions of the self, LeDoux links the 'narrative self' to the 'postmodern notion that the self is socially constructed' and states that:

> While social construction is often viewed as diametrically opposed to a scientific view of man, the two are not necessarily at odds with each other since brains, in the end, are responsible for both the behaviours that collectively constitute the social milieu, and for the reception by each individual of the information conveyed by this milieu (p. 20).

Several points may be made here: First, in the above a clear distinction is drawn between the social and biological with the former being defined as the sum of individual behaviours. This is what Cromby (2007) calls 'methodological individualism' (p. 163), a simplistic reading of the social that does not realise that social groups *as groups* have characteristics that cannot be ascribed to the individual multiplied but are properties that emerge from a collective immersed in a particular historical trajectory and material conditions. He argues that this is the consequence of a discipline reliant on experimentation, where 'groups are simply constituted from the aggregate or average scores of experimenter-allocated individuals' (p. 164). Ironic here is that the notion of emergence is a prominent feature of LeDoux's theory. For example, he indicates that 'feelings emerge from neural processes' (p. 209), 'anxiety as a psychological state emerg[es] out of a synaptically connected system' (p. 288), and that 'individual pieces blend together to cause a person to emerge effortlessly from the electrochemical activities of the protoplasmic mass that is his or her brain' (p. 301).

Second, and of more importance given my recent claim that this functions in inverted form, what is overtly claimed here is the distinctness and primacy of the biological or, more

specifically, the neural, over the social. This position is also notable in the following quote where the neural is located as foundational (lower) in contrast to the social (higher):

> …it is important to understand the role of brain mechanisms in social interactions, but I'd like to try and reach the social level by climbing up to it from the neurobiology of specific brain networks rather than start at the social level and try to find brain correlates' (p. 329).

Third, one could follow a social constructionist line and argue that 'brain', as a concept, is the product of a set of meanings that enjoys support and traffic amongst particular social groups (e.g., neuroscientists) who occupy positions of status (social capital) and influence. The 'brain', as object, is salient, surrounded and sustained by a proliferation of practices and discourses, within a particular society (geographically and historically) and, as such, it is not outside of the society which includes it in its discourse. In this sense it is not prior to or outside of society or discourse. But (departing from a discursive-reductionist rendering of social constructionism) neither is it, as an extra-discursive physicality, limited to discourse, a pure fiction as such (if there could be a thing completely and utterly divorced from the materiality that both surrounds and constitutes us). In this way, 'discourse about the brain' (social) and the 'brain capable of engaging in discourse' (biological) are folded into one another, neither one able to be made clearly distinct (pure) from its other, neither one possible without the other. This reciprocity between the social and biological, an unavoidable mutual contamination, what Staten (1984) refers to as the 'essential law of impurity' (p. 19), is clearly absent from the above quotes.

In defence of reductionism, LeDoux distinguishes between 'absurd' and 'nonabsurd reductions', where understanding 'poetry in terms of subatomic particles' is an example of the former whilst understanding 'the self in terms of synapses' the latter. His text is, of course, partly an attempt to justify why the latter should escape a categorisation as absurd. The notion of absurdity, however, lies at the heart of the reductionist endeavour since: i) To claim a position of pure reduction, that is, one that excludes the possibility of any

contribution to mind other than brain, or to self other than synaptic dynamics[44], is absurd because it excludes the contents of mind (e.g., interpersonal experiences, sensations, memories) and the characteristics of self (e.g., idiosyncratic mannerisms, posture, turns of phrase) that clearly are constitutive of (productive of) mind and self and clearly neither brain nor synapse (although undoubtedly *enabled* by these structures)[45]. ii) To include other disciplines as capable of contributing meaningfully to the self or mind whilst retaining a reductionist position (as LeDoux does) is also absurd since the possibility of a pure reduction then becomes impossible. If there is the possibility of the other contributing or being legitimate then surely the reduction you are claiming is in need of supplementation and accordingly the equations indicated above are impossible? iii) And yet the project of explicating the neural aspect of our being must be reductionist. As LeDoux points out, referring to his use of Kandel and Spencer's cellular-connection approach, if we hope to understand a system as complex as the brain then this requires a modest ambition; that is, a focus on constituent parts and simple functions. This, of course, runs the very real risk of slipping into the logic of elementalism which robs the system of its dynamic nature and simplistically ties functions into locations. iv) Finally, the project of neuroscience is necessary for, as demonstrated in Chapter 3, to ignore the neural is to slip into other (discursive, social) reductionist understandings of our being. Therefore, to conclude, we have in neuroscience a project which is both necessarily reductionist (points iii and iv) and impossible (points i and ii), what we may refer to as the aporia of reduction.

So, similar to the aporias involved in ethical decision making as described by Derrida (Hurst, 2004), we find that non-engagement with the neural is not possible (if we are to take ourselves seriously as critical academics) nor can engagement produce a pure object (if we are to take ourselves seriously as conceptually rigorous scientists). Hence neuroscience needs to continue with the reductionist project, articulating chemical processes, circuits, systems, the brain, the nervous system, functional correlates, and so forth. But this knowledge must be received humbly and critically with the recognition that pure reduction

[44] That LeDoux's dynamic architecture cannot be conceived outside of context and content is a point made again in Chapter 8 in the discussion on connectionism.

[45] This is a version of Bennett and Hacker's (2003) mereological fallacy argument.

is impossible, and that the excluded or homogenised other, that is, the social, will penetrate through to the heart of the object and the discipline. Furthermore, a point made in the previous chapter, within the brain itself, a function will always exceed the limits of a neural structure, deferring to other structures beyond itself, never complete in itself, never simply located. In accordance with this, systematic attempts at delimiting an appropriate discourse or set of concepts for the discussion of neural events that does not result in conceptual confusions or nonsensical claims still admit to the impossibility of pure reduction (Bennett & Hacker, 2003) and the necessary 'hybridity' of such a discourse with other 'grammars' (Cromby, 2007; Harré, 2002)[46].

The reductionist problematic lies at the heart of the social/biological binary. Whether it is through rendering the biological inert, as clay for shaping by social and cultural forces, or the portrayal of the social as homogeneous, positioning the neural as the origin of mind and self, the result is the same: There is a reduction at work that retains a social/biological binary where the other is marginalised (Blackman, 2008). But, as Wilson (2004) points out, the critical agenda has possibly much to be gained by considering the products of the reductionist strategy. In the case of LeDoux, his work at the molecular level of neuronal interaction reveals a remarkable corporeality, one that is open, malleable and radical. We turn to consider this reading of neural biology in the next section.

The illusion of sidestepping

Before moving on to mull over LeDoux's neurology, let us first consider an assemblage of binaries that he constructs around what he calls the 'credibility problem'. In his chapter on emotion, LeDoux draws a distinction between feeling and emotion where, as with Damasio (1994)[47], the former is aligned with experience which is private, whilst the latter is associated with behaviour which is public (observable). LeDoux states that researchers have traditionally aimed to account for feelings, that which 'most people think of as the essence of an emotion, the subjective experience that occurs during an emotional state…' (p. 201). This, however, is problematic since 'most of what we know about the detailed

[46] See Chapter 2.

[47] See Chapter 5.

brain mechanisms of emotion comes from studies of emotional behaviour rather than from studies of feelings themselves' (p. 202). Thus there is a gap between what is experienced (phenomenology) and that which is studied. This lack of alignment between what is of interest (feelings) and what is actually researched (emotions) creates a credibility problem in that the question is raised as to how statements about the latter can validly be used to make statements about the former.

LeDoux states that the reason for this disparity is that, for practical and ethical reasons, most research is conducted on animals. The primary method for studying feelings is through self-report and animals cannot engage in this practice as humans can. But, argues LeDoux, self-evaluation in itself is a flawed method since what is remembered does not reflect what was actually experienced; distortions being found experimentally in terms of the recollection of both the intensity and content of an experience. Immediate reports during actual emotional experiences then seem to provide an alternative method to circumvent such distortions but remain problematic on pragmatic grounds. More fundamentally, both methods labour under the 'biases and measurement problems inherent in any method that relies on introspective evaluation of his or her mental states'; a fallible and subjective method (p. 203). Furthermore, such reports 'inescapably involve the use of words to classify and categorise mental content' (p. 203), this need to use language being regarded as further distorting the original experience. Most important, however, is that '[e]motional responses are not always external mirrors of internal feelings…' (p. 204); there is a lack of alignment between emotions and feelings: 'The fact that we have feelings when we act emotional does not mean that every act that looks emotional is accompanied by feelings' (p. 204). What is then left as a scientifically legitimate object for the study of emotion is nonverbal behaviour.

LeDoux's solution to the credibility problem is to marginalise feelings or, more broadly, experiential content: 'The trick was to treat the mind as an information-processing device rather than a place where experiences occur' (p. 205). Accordingly:

> The fact that cognitive processes are not dependent on consciousness (actually, consciousness depends on *unconscious* cognitive processes) means that the mental vs. physical dilemma does not have to be overcome in order to study the brain mechanisms of cognition (p. 23, emphases in original).

So the trick is to invert the feeling/emotion binary; where previously feelings as content were to be studied; it is now emotions as process that enjoy the primary position. Feelings are displaced as only the conscious part of emotion and emotional processing becomes the principal research object. However, LeDoux admits that this is a compromise in that 'I avoid the construction of a theory that can never be proven, but at the expense of having one that may be incomplete' (p. 206).

One way to approach the above articulation is by considering the numerous binaries that LeDoux evokes across the instances in which the credibility issue is discussed. In no specific order these include: observation/introspection, measurement/language, objectivity/ subjectivity, immediate/remembered, actual/hypothetical, process/content, description/ construction, practical/impractical, accurate/distorted, artificial laboratory/natural setting, public/private, emotions/feelings, animals/humans, brain systems/subjective states, and testability/comprehensiveness. It is notable that the first terms of each opposition are aligned and privileged. What becomes clear is that they comprise the standard view of a rigorous and pure science. Any claim to purity (strict demarcation) is of course an invitation to engage in a deconstructive reading which demonstrates how the primary term is dependent on or contaminated by the term which it excludes. The fragility of the idea of a science divided from interpretation (construction), and of empiricism divided from theory, is addressed elsewhere[48], as is the attempt to sever immediate experience (perception) from recollection (memory)[49], so I will here only raise a few questions:

[48] See Chapter 4.

[49] See Chapter 5. An example from LeDoux's text: '[M]emories are constructions assembled at the time of retrieval, and the information stored during the initial experience is only one of the items used in the construction; other contributors include information already stored in the brain, as well as things the person hears or sees and then stores after the experience' (p. 203). This begs the question as to how perception escapes the temporal context that memory is subject to.

i) When LeDoux states that it is 'possible to examine how the brain processes the emotional significance of a stimulus without necessarily first figuring out how that stimulus comes to elicit conscious feelings' (p. 205), how are we able to tell that something is emotionally significant without, in the final instance, resorting to feelings (and the host of terms it is aligned with)? Even if conducted on animals do we not recognise a response or behaviour as emotional by having originally tied this to (human) experience? ii) When he tells us of Hebb's claim that 'outside observers are often more accurate in characterising emotional feelings than the experiencing subject' (p. 202), how is it possible for the public to have *privileged* access to a supposedly private realm? Does this not then speak of the social and political nature of such attributions whether personal or of another? iii) When he indicates that 'our conscious awareness of who we are depends on our linguistic interpretation (labelling, categorising, explaining) of our experiences as we go through life…' (p. 199), we may ask how it is then possible to lay claim to a pre-lingual experience[50] at all or how subjective interpretation may be prevented from invading description in general whether private or public. iv) Referring to brain scan research, how can objectivity be claimed when LeDoux points out that 'these studies don't measure neural activity but instead *infer* it from such measures as blood oxygenation in fMRI studies or blood flow in PET studies' (p. 349, emphasis added). v) If context infiltrates brain functioning in such a profound way as suggested in the quote below then how can laboratory science claim to be pure or in closer proximity to the truth?

> Although individual [brain] regions may make a relatively greater contribution in different aspects of working memory, especially in controlled laboratory settings, in more natural settings, where decisions involve the integration of cognitive and emotional information, it is likely that interactions rather than dissociations between the areas will be commonplace (p. 254).

[50] See discussion on social constructionism in Chapter 3.

I will now consider other ways in which LeDoux's text places 'science under erasure, [revealing] a science at odds with the binarism that seeks to control it' (Wilson, 1988, p. 88).

EPIGENESIS, EXUBERANCE, AND CONTEXT

This section provides a reading of several themes in LeDoux's text that speak of the surprising nature of neural materiality. This, of course, has implications for the general articulation of corporeality; one which those involved in the more critical agendas of psychology may be interested in. It is acknowledged, as with Goldberg and, to a far lesser extent, Damasio, that LeDoux speaks only of an aspect of the body; the neural. This, as discussed in the closing chapter of this project, is both a limitation, in that it is exclusionary, and is, more broadly, a symptom of our neurally obsessed culture. Though, as a centre for the proliferation of discourse and investment of financial resource and identity (Rose, 2007), the neural is a good locus for critical engagement. This section is structured across three sub-sections which create a pragmatic though artificial separation between the issues discussed – thus a leakage between the sub-sections is inevitable though not undesirable. These deal with the genetics/environment binary, the selection/instruction debate, and the centrality of context, respectively.

'Glued together by life': Nature and nurture

As pointed out, Wilson (1998, 2004) highlights the dogmatic response by many feminists who indicate that engaging with the biological body is to unavoidably court biological determinism. Such determinism is considered reductionist; in that realms beyond the biological, such as social and cultural, are explained via biologically determined causes. Biology, made distinct from the social, may thus serve as an unchangeable foundation for the establishment of the limits of identity (Grosz, 1990). The research of the biological sciences, including the neurosciences, is used as evidence to ground claims about our social and psychological limitations, which then justifies continued discrimination against groups such as women, homosexuals and blacks. And at the heart of this determinism lies the emblem of biologism: genetics. In the distinction between nature and nurture it is genetics

which is primary and dominant. Hence any discussion that engages with the topic of genes as a (partial) articulation about 'who we are' may very well have crossed the line of those self-identifying as 'critical' and may accordingly be rejected as material for theorising the body-subject. Of course, the aim here is to go where beautiful souls fear to tread and to closely read what LeDoux has to say on this matter. I argue that what emerges is well worth considering, since it is a complexity which, as Rose (2007) points out, troubles any simplistic attempt at asserting a pure genetic determinism.

In some passages LeDoux retains a simple nature/nurture (genes/environment) binary; genes determine us from the inside out whilst the environment sculpts us from the outside in, two mutually exclusive processes. But even in these moments a complex relationship is discernable, one marked by partial domination and determination. On several occasions LeDoux points out that genes account 'for at most 50 percent of a given trait, and in many instances far less' (p. 5) and that what is specified is a 'broad outline' (p. 5), where only 'the basic wiring plan of the brain is under genetic influence' (p. 4). Aside from ascribing a percentage to the degree of genetic influence, he also describes a dynamic in which genes 'do two things'; 'they make us all the same (we're all humans), and they distinguish us one from another (each of us has a unique genetic makeup that contributes to our individuality)' (p. 3). With identity and difference (variability), the latter finds increased expression as we move from the species to the family to the individual:

> Genes may play an essential role in placing a function in the brain of every human, and at the time make a *relatively small contribution to differences* in the way that function is wired in individuals (p. 91, emphases added).

In other words, there is the expression of individual variability through genes; the symbol of universality and of determination is identified here as a site of individuation. Of course this is a cause for concern for critical approaches if individual variability is solely the result of genetic influence, thus erasing, or placing genetics beyond, the influence of the socio-political. Genetics is however contrasted with the individual's experience of the environment, LeDoux distinguishing between 'personal' and 'ancestral history' (p. 67).

This is an important description since it places time at the heart of both processes. The neatness of the boundary between these two agents is blurred as LeDoux reiterates Daniel Lehrmann's point from the 1950s that 'the organism is never completely isolated from non-genetic influences, such as things that happened prenatally or shortly after birth' (pp. 82-83): It is very difficult to distil genes from their context.

For LeDoux 'gene expression is an *epigenetic* phenomenon' (p. 297, emphasis in original), emerging through interaction with the environment. Genes and environment are positioned as sculptors of the self by influencing the diversity of neural connections that constitute the nervous system. There is a repositioning happening here, one that complexifies the biological/social distinction, where stereotypically either the body-subject is the passive result of genetics or is sculpted by society. Here a more complex relationship is indicated; genes have to work in collaboration with external processes in order to produce something that may survive, be complete, sustainable.

LeDoux returns to epigenesis repeatedly across the text, but also mentions other dynamics that limit the potency of genetic expression as a pure force; that of polygenetic influence (where multiple genes play a role in a function or feature, this multiplicity actually increasing the size of environmental influence), nonpenetrance (where genes vary in their degree of expression from one individual to another), and non-genetic factors (where genes play no role in the emergence of, say, a mental illness). Therefore, even within the confines of the strict binary, genes display a complex dynamic and great phenotypic variability.

> The dichotomy, in fact, begins to dissolve when it is realised that, regarding questions of mind and behaviour, nature and nurture are really two ways of doing the same thing - wiring up synapses – and both are needed to get the job done (p. 66).

Although LeDoux tries to trouble the dichotomy by indicating that they share job descriptions, there are moments when this becomes more radical. Core to LeDoux's theory is the notion of plasticity: 'Most systems of the brain are plastic, that is, modifiable by

experience' (p. 8). The brain is generally open to being influenced by the extra-neural, making us, as LeDoux puts it in a discussion on rats, 'more worldly, and much better off…' (p. 9). Plasticity also marks a place where genes as determinant becomes central to a brain that is open to the environment:

> Plasticity in all the brain's systems is *an innately determined characteristic*… All learning, in other words, depends on the operation of genetically programmed capacities to learn. (p. 9, emphases added)

So the propensity for experiential learning (individual sedimentation) is a sedimented capacity. The malleability of the body, its escape from genetic determinism, is a product of (is determined by) ancestral history. The possibility of difference, of individual variation, of openness to influence by environmental contingency, is the result of the repeated trans-individual identity/difference of genetic transmission.

There is a further way in which genetics escapes a determinist stereotype: LeDoux suggests that we should rather concern ourselves with whether something *is* innate than *why* it is innate. Here he refers to Steven Jay Gould's notion of 'exaptation':

> [L]anguage and other mental functions that are being touted as innate are not evolutionary adaptations, traits that are selected for, but rather are exaptations, features that enhance our fitness but weren't originally designed to do what we use them for (p. 85).

Without going into the problematic of an original purpose, we still have here an example of the malleability of the body, where genes do not determine the function but is a constrained openness that allows innovation and interpretation; 'something can be innate (passed on genetically) even if the role it plays today is not the one which for which it evolved' (p. 85).

What is remarkable about this notion of epigenesis is that it offers us an image of the body as a shifting foundation:

> All systems operate on the basis of synaptic connections that are epigenetically specified during early development… and then altered each time the neural system involved is active and engages in some form of learning (p. 339).

Thus 'every time the infant learns something, his or her brain is changed in a way that helps it [to] learn something else' (p. 96). In the neural body a foundation is but a temporary entity, compiled by two coinciding histories, acting as the provisional grounds for the next articulation which in turn becomes the next foundation, and so on and so forth. An impermanent scaffolding[51] constructed by entwined historically embedded processes producing a contingent body-subject.

In the landscape described above it is difficult to attribute primacy to either genetics or the environment. The above is problematic in that it still seems to leave our biology as passive matter awaiting the form giving actions of the other, whether gene or environment. But perhaps we could argue that this is a gross reading of the complexity[52] revealed by LeDoux; that there is no simple passive/active distinction to be imposed here but, rather, the simultaneous presence of both. In order to explore this possibility we pay attention to synaptic dynamics in the next subsection.

'The exuberantly wired brain': Plasticity

The nature/nurture binary again occurs in LeDoux's discussion of the selection versus instruction debate which attempts to formalise the early development of neural structure. The instruction (nurture) position is aligned with constructivism which argues that structure (with the exception of broad genetically determined scaffolds) is extracted from the environment resulting in the creation of additional and novel neural connections. The selection (nature) position, aligned with nativism, argues that the brain is sculpted from an exuberant mass of neural connections. Central to this proposed process is *activity*, in that

[51] There is a notable resemblance here with Merleau-Ponty's notion of the dynamic sculpting of the body where previously acquired routines (habits) act as scaffolding. See Chapter 3.

[52] Partly because it positions genetics as outside of biology and corporeality where it is in fact present in and enabled by processes in every single cell that constitutes the body.

those connections which are used are maintained whilst those that are less or non-active are pruned (a process called 'synaptic regression'). What is interesting is that this exuberance is characterised by a random proliferation of connections. Determinism is thus undermined as genes only specify broad directions for connection. Learning is then defined as a process of internal selection rather than the transfer (internalisation) of external structure, the functional brain being 'parameterised' (pruned) into existence.

Supporters of selectionism state that 'the self… is not constructed, it is selected from pre-existing possibilities' (p. 74). This seems like an odd claim, as if there are already various selves present in the brain, ghosts wandering the halls waiting to be summoned. The emergence of a self through the pruning of an abundance of connections is surely closer to construction than it is to selection? There is, after all, no self or selves prior to this process? With regard to instructionism, LeDoux points out several simplistic binary assumptions made by this approach which posits a distinction between primary cortical and secondary subcortical structures, where the former is dominant and plastic and the latter marginal and hardwired. He muddies this set of distinctions by indicating that the sub-cortex has a significant influence on brain function, that the cortex is not exclusively plastic nor is the subcortex just hardwired, and that genes, not only the environment, exploit plasticity.

What emerges out of this debate is that neither side is right or wrong; empirical evidence indicates that neural activity both prevents the loss of connections *and* increases the synaptic complexity of active neurons[53].

> New connections formed by activity are not created as entirely new entities but rather are added to intrinsically determined pre-existing connections. Added connections are more like new buds on a branch rather than new branches (p. 78).

It is then activity which 'adds those little adjustments that make you and me different' (p. 78). Aside from random neural activity, such activity emerges by being immersed in the

[53] The limits of empirical claims are only mentioned by LeDoux in an end note; for example, it is difficult to tell functional from non-functional synapses and, in early development, synapses may already be functional before they are identifiable as synapses.

extra-neural. The above demonstrates how an attempt at privileging one side over the other distorts a more complex picture of the relationship between genetics, the environment, and, as importantly, the random. Wilden's (1980) point seems salient here; 'the epistemological error was to impose an 'either/or' (closed system) logic on a 'both/and' (open system) reality' (p. 216)[54].

Increasing attention to detail also troubles other images of the biological body. In engaging historical detail LeDoux describes the discovery and articulation of long term potentiation (LTP); the long-lasting elevated responsiveness of the postsynaptic dendrite following an action potential. LTP is rapidly acquired, is persistent, and is specific to simultaneously active synapses. Varying degrees of persistence distinguishes early and late types of LTP. The molecular processes involved will be briefly described here so as to demonstrate their intricacy and to then be able to consider the consequences this holds for reading the neural body.

The primary excitatory neurotransmitter, glutamate, binds with a postsynaptic AMPA receptor which is involved in regular neural transmission. This action on the AMPA receptor unblocks a second receptor, NMDA, which is concerned with synaptic plasticity. Glutamate can now bind to this receptor and calcium flows into the cell. Calcium is a 'second messenger' (p. 147) which acts inside the cell (unlike first messengers which act on receptors on the postsynaptic surface) and activates enzymes called kinases. These proteins activate AMPA receptor proteins through a process called phosphorylation which results in an increased number of AMPA receptors. The greater density of such receptors means that glutamate will have a greater effect in terms of stimulating an action potential in the postsynaptic neuron. This synaptic alteration includes changes to the presynaptic cell via 'retrograde messengers'[55] (p. 148) which results in increased amounts of glutamate being released when the presynaptic axon terminal is stimulated by an action potential. Early and late LTP are distinguished in that the former utilises pre-existing proteins whilst the latter

[54] The complexities of the relationship between the economic and aneconomic aspects of *différance* are discussed again in the concluding chapter.

[55] A claim which LeDoux points out was still, at the time of writing, considered controversial in the neuroscientific community.

involves protein synthesis. Here strong high frequency signals result in the activation of kinases which trigger a gene transcription factor called CREB. This activates genes which produce proteins that travel back to previously active synapses (recognisable since they are molecularly 'tagged' by this activity) and more AMPA receptors are produced. Neurotrophins (growth factors) are also released from the active postsynaptic cell which enables presynaptic cells to form new synaptic connections with the postsynaptic neuron, this enabling a presynaptic action potential to have a greater effect postsynaptically. The above processes involve all of the neuron's synapses that were active (and thus 'tagged' for strengthening) at the time.

LTP is associated with Hebbian plasticity and memory in its broadest sense. Hebbian plasticity refers to when 'weak and strong inputs to a cell are active at the same time, [and] the weak pathway is strengthened by way of its association with the strong pathway' (p. 136). Essential to its definition is the presence of both pre- and postsynaptic activity. Strengthening means that the next time a similar stimulus occurs, strengthened synapses, forming a circuit, will be activated. The form of LTP described above is regarded as a molecular description of this form of plasticity. Hebbian learning is believed to be 'a major way that memories are made' (p. 137). There has been a 'long quest to relate LTP and memory' (p. 156) but LeDoux claims to now be 'a proselytiser' (p. 155) after a study by Rogan 'showed that fear conditioning and LTP induction produced similar changes in the electrical responses of amygdala cells to sound stimuli. Fear conditioning, in other words, seems to induce LTP' (p. 156).

Early and late LTP are now considered the chemical analogues of short and long-term memory. LTP has been linked to both Hebbian (involving association between stimuli) and non-Hebbian (non-associative, single stimulus) forms of learning. The latter requires only presynaptic changes, and is commonly referred to as sensitisation, whilst the former requires pre- and postsynaptic modifications and is generally called classical conditioning.

The above has some interesting implications: In the connecting of environmental event, behavioural response and synaptic change, the intimate relationship between the

environment, the organism and the neural is demonstrated. Here, declares LeDoux, was 'a mechanism that might be used to record and store information about life's experiences' (p. 140). Neuroscience's founding assumption of material-functional intimacy was thus placed on more solid (molecular) ground: 'Each time the brain learns something it is changed' (p. 336)[56]. This is profound since 'synaptic plasticity occurs in most if not all brain systems', that is, emotion, memory, sensory, and motor systems are open to 'being modified by experience' (pp. 303-304). LeDoux makes the important point that these systems are 'not designed as storage devices – plasticity is not their main job assignment… Plasticity is simply a feature that helps them do their job better' (p. 304). Thus he draws a distinction between memory as function and plasticity as a neural feature that facilitates functionality; function emerges, is effective and adaptive, due to an innate openness. Furthermore, a unifying physiology, a shared evolutionary history, is indicated in that synaptic plasticity has been shown to be achieved in a similar fashion across a diversity of species in various learning contexts. Historically and contextually we are immersed in and of the world and each other.

Finally, an intriguing notion introduced by LeDoux is the finding by Nader and Schafe, termed 'reconsolidation', where:

> protein synthesis in the amygdala seems necessary for a recently activated memory to be kept as a memory. That is, if you take a memory out of storage you have to make new proteins (you have to restore or reconsolidate it) in order for the memory to remain a memory (p. 161).

This suggests that a remarkable form of repetition takes place in/between neurons, where the constancy of a function depends on a repeated process of molecular activity. This challenges the notion that a consolidated ability or memory is simply stable and instead reveals a reliance on activity and repetition; a biology that is remarkable vulnerable and anything but stable or passive.

[56] I do not address the presence of what Bennett and Hacker (2003) call the mereological fallacy (that is, in this case, it is organisms that 'learn' not brains) in this chapter. This is discussed in relation to Damasio's text in Chapter 5.

Such discoveries open up the body to new forms of technological intervention as previously taken-for-granted stabilities become susceptible to 'treatment' (Rose, 2007). Another example of this is amapakine treatment which, through increasing the efficiency of glutamate transmission at AMPA receptors, allows weaker stimulation to activate NMDA receptors involved in the long-term strengthening of synaptic connections. This has been found to enhance learning in rats especially when such transmission was enhanced in the hippocampus. Hence as research reveals a remarkable neural malleability they also open up the body to interventions of ever increasing subtlety and specificity[57].

LeDoux's discussion of, and position on, the selectionist versus instruction debate reveals an exuberant materiality, a generous neurology that troubles both determinist and constructivist readings. From selectionism, the notion that all configurations already exist is troubled by the occurrence of synaptic proliferation, whilst constructivism's faith in the omnipotence of environmental agency is limited by the abundance of synaptic possibilities also exploited by genetically based processes. As the description of molecular processes further reveals, the emergence of an idiosyncratic nervous system cannot be extricated from its context or from the necessity of activity which is linked to notions of plasticity, synaptic strengthening, reconsolidation and regression. Plasticity is an indication of the openness of the nervous system, its malleability and flexibility. This propensity is, as discussed in the previous sub-section, sedimented genetically. Furthermore, it represents simultaneously a closing (consolidation, sedimentation) and opening (malleability) of connection, where each instant of activity requires reconsolidation in order for a circuit to remain entrenched. This indicates a system, a comprehensive material vitality, built on a 'fundamental' in/stability of essential repetition and activity.

'By virtue of its position': Context

LeDoux opens the third chapter of his book with a discussion of some common beliefs about the brain that he points out are 'part truths that, taken out of context, are patently false' (p. 33). That the truth of something, its identity, is dependent on that which 'it' is

[57] The political consequences of this opening up of the body are discussed in Chapter 8.

not, that it is reliant on that which is its difference, its context, is *the* Derridean theme (Staten, 1984). And, as I will now illustrate, this is an idea which repeats itself across LeDoux's text, where we find plays of difference founded upon plays of difference, from the neuronal to the structural and beyond and back again, a shimmer of entwined activity. Identity emerges not intrinsically but through the location of the element in a larger context.

Although LeDoux describes the brain as a 'connection machine' of sorts comprised of 'multiple processors' (p. 357), it is only due to the varying location of the physicality of the (synaptic) connection that a system can (emerge as) function. For example: 'The amygdala detects danger *by virtue of its position* in a synaptically connected system' (p. 61, emphases added). The emergence of identity through difference means that the neuron is liberated, opened up, made versatile; 'a given cell can participate in the storage of information about many different experiences so long as different synapses on the cell are involved in receiving them.' (p. 141).

Does this then require the complete erasure of the significance of 'intrinsic properties' (p. 64)?

> But because psychological and behavioural functions are mediated by aggregates of cells joined by synapses and working together rather than individual neurons in isolation, the contribution of intrinsic properties of a cell to mental life or behaviour occurs only by way of the role of that cell in circuits. While synapses themselves don't account for everything the brain does, they do participate crucially in every act or thought that we have, and in every emotion we express and experience. Synapses are ultimately the key to the brain's many functions, and thus to the self. (p. 64)

When LeDoux indicates that 'the self is synaptic', he is stating that the self does not emerge from some intrinsic element, some content, but 'reflects *patterns of interconnectivity* between neurons in the brain' (p. 2, emphases added)[58]. That is, these unique patterns

[58] See discussion on connectionism in Chapter 8.

emerge from the difference between synaptic strengths across cell ensembles and systems as they are activated by events across time. The diacritical nature of what is being described here bears striking resemblance to the 'notion' of *différance*. But if meaning/function emerge through 'the play of difference'/'the pattern of activation' between words/synapses, then the 'marking of the quill'/'materiality of the neuron' is necessary for this to be possible.

The materiality of the connection is however double edged; it brings about emergent potential but it is also based on the delicacy of the synaptic caress: 'That the self is synaptic can be a curse – it doesn't take much to break it apart' (p. 324). LeDoux's 'bottom line is simple: Functions depend on connections; break the connections, and you lose the functions' (p. 304). As was noted in the previous sub-section, this delicacy is comprised of a complex synaptic process. However, even at this level of the chemical the diacritical process is noted; the identity of the molecule, that is, its function, is determined by its location. It is, for example, possible for vasopressin and oxytocin to have multiple identities 'not just as hormones, but also as neurotransmitters and/or modulators…' (p. 231):

> Not all modulators have the same effect (some inhibit rather than enhance plasticity), and the same modulator can have different effects depending on the particular postsynaptic receptor with which it interacts. Moreover, the same interaction between the modulator and its receptor can be different depending on the other cells in the circuit. (p. 315)

The synapse itself is a fluctuating difference 'changing [in] size over time' (p. 334). As a space it is a non-connecting connection, a gap that allows the analogical complexity of bidirectional molecular communications.

At the level of macrostructures the play of difference is also visible, otherwise why, for example, would 'a consideration of the connections between the hippocampus and the amygdala, and their contribution to the contextualisation of fear…' (p. 215) be important?

The patterns of difference extend beyond local circuits to the play of difference between structures, for example, to the 'patterns of neural activity *within and between* the amygdala, hippocampus, and medial prefrontal cortex…' (p. 294, emphases added).

Beyond these neural levels, the self as 'complex constellation' (p. 31) 'always occurs in a physical and social context (a situation)' (pp. 31-32). Although LeDoux never explicitly develops the notion, his acknowledgement of the 'situation' indicates that a context that extends beyond the neural is salient to understanding the activity of neural systems. That is, the body-subject is embedded. The impact of this context is profound: As the passage from page 254 quoted in the previous section (p. 290) shows, whether the context is a laboratory or 'natural' setting will influence whether brain areas function in a integrated or dissociated fashion.

In summation, the context of the synapse is then the circuit, the system, the corporeal, the environment, and the socio-cultural[59]. So when LeDoux writes of a synaptic self what is evoked is not simple, for it is the physicality and the intricate molecular processes of 'our star, the synapse' (p. 42), it is the pattern of differences distributed across a multitude of synapses (whether circuit or system or system of systems), and it is the immersed intimacy of this multiplicity in an extra-neural context. Neural material is sensitive and intimate, its identity emergent, marked by variability at every level, by subtle shifts across contexts, everything in relationship, nothing isolated, nothing complete in itself. How the question of a foundation, as constant ground, can be asked in the midst of such complexity, can only be due a reductionist logic of some violence. To punctuate the self at the level of molecular 'soup' (p. 262) or, its advancement, neural circuits (the idea that 'alterations in synaptic connectivity in neural circuits, rather than just levels of neurotransmitters or receptors are important' (p. 270)) is a privileging of equal brutality if the context of such activity is homogenised or methodi(logi)cally forgotten.

[59] It is also 'the vast continuous sea of liquid in which all the neurons of the nervous system are bathed' (p. 332), an extracellular space that is not without influence.

CONSCIOUSNESS AND COHERENCE

The implicitness of the explicit

In the second chapter of *Synaptic self*, LeDoux considers several conceptualisations of the person and self and concludes that they 'leave out much of who we are – all the unconscious aspects' (p. 20). He points out how Descartes equated the mental to consciousness and in so doing set up a schema where consciousness, which 'concerns an aspect of the mind rather than the whole mind' (p. 17), has since enjoyed centre stage, this reading infiltrating both psychology and neuroscience. Instead, LeDoux argues, the self is 'the totality of the living organism' which includes the idea of personality, in which the person is equated with consciousness (p. 26)[60]. Not only does this definition then include the unconscious but LeDoux also grants this multiplicity primacy: 'consciousness depends on *unconscious* cognitive processes' (p. 23, emphasis in original).

> Unconscious operation of the brain is… the rule rather than the exception throughout the evolutionary history of the animal kingdom. It's a linguistic quirk, or a revealing cultural assumption, that the older (unconscious) processes are defined as negations of the newer one (consciousness). Language isn't perfect. (p. 11)

The unconscious cannot simply be considered the other (the negation, the not) of consciousness. Instead consciousness can be thought of as a 'product of underlying cognitive processes' (p. 191), where consciousness is equated with the contents of working memory, associated with the prefrontal lobes[61]. Experience is then comprised of the products of the 'later processing areas [that] are connected with the prefrontal cortex' (p.

[60] A little later LeDoux expands on this definition: 'In my view, the self is a totality of what an organism is physically, biologically, psychologically, socially, and culturally' (p. 31). That this definition exceeds his other earlier reductive equation 'the self is synaptic' (p. 2) is discussed in more detail in the earlier section on reductionism. Central in the current section is LeDoux's distinction between the implicit and explicit.

[61] This equating of the prefrontal lobes with consciousness is not without supplementation, another level possibly exists which is cast as archaic and passive: '[T]here may exist primitive levels of consciousness, especially involving the passive awareness of events as opposed to the active use of on-line information to guide decision-making and behaviour, that do not depend on the prefrontal cortex' (p. 192).

193). LeDoux thus aligns with a tradition, which includes Nietzsche and Freud, which decentres consciousness and locates the unconscious as the grounds for its emergence.

LeDoux proceeds to develop his notion of the self; it is a unit[62], is not static but typified by constant change, and is the product of both genetic and learning processes. At its core, lies the conscious/unconscious binary, referred to as the explicit and implicit:

> The implicit aspects of the self… are all the aspects of who we are that are not immediately available to consciousness, either because they are by nature inaccessible, or because they are accessible but not being accessed at the moment. (pp. 27-28)

Although the latter phrase bears a resemblance to Freud's notion of the preconscious, LeDoux distances himself from Freud's notion of the unconscious as the domain of the repressed. Instead the physicality of the brain is divided into 'systems that are able to store specific kinds of information implicitly' and systems that constitute the 'explicit aspects of the self' (p. 28). It is through these two types of systems that the self is maintained.

LeDoux's seventh principle indicates that there is a schism that divides these two systems, characterised by a play of dominance which is always partial and temporary:

> Through explicit systems, we try to wilfully dictate who we are, and how we will behave. But we are only partially effective in doing so, since we have *imperfect* conscious access to emotional systems. In spite of their importance, though, emotion systems are not always active and have only episodic influence on what other brain systems learn and store. Furthermore, because there are multiple independent emotion systems, the episodic influence of any one system is itself but a component of the total impact of emotions on self-development. (p. 323, emphasis added)

[62] This notion is the focus of the final sub-section of this chapter.

I would like to pick up on two points in the above quote; the first is the emphasis on emotion and the other is the description of conscious access as 'imperfect'. LeDoux's elucidation of the first carefully establishes the dominance of the implicit, whilst his use of 'imperfect', I will argue, attempts a simplistic inversion of such a reading of the neural.

The subcortical constitutes the 'low road', the path that does not include the neocortex (the 'high road') and therefore consciousness. The 'low road' is differentiated from the 'high road' in that the former is quicker allowing it to initiate a reaction based on a crude analysis of a stimulus, whilst the latter, acting more slowly and consciously, can provide a more detailed analysis of a situation confirming or altering the initial interpretation made implicitly.

Amongst the various subcortical systems are those associated with the emotional functions. Countering the hypothesis of one general emotional system, the so-called limbic system theory, LeDoux provides evidence for the existence of multiple emotional neural systems, such as the fear and sex circuits. As noted with his sixth principle, the influence of these systems should not be underestimated: 'Emotional arousal has powerful influences on cognitive processing' to the point that 'emotional arousal organises and coordinates brain activity' (p. 225). Goldberg's conductor[63], the prefrontal lobes, are in LeDoux's text cast from their podium by a multitude of emotion systems, of which we only experience their products (that is, feelings) as they work away outside of consciousness.

Furthermore, motivation, as the third leg of LeDoux's mental trilogy, is also subservient to the rule of emotion. It occupies a betwixt role, a positioning captured by the comment that the nucleus accumbens, a central structure in motivation, 'sits at the crossroads of emotion and movement' (p. 247). The 'motive circuit' (p. 267) described by LeDoux has the appearance of a conduit, a tool of emotion, described as 'a circuit through which emotional stimuli direct behaviour towards goals' (p. 247). It is the emotional systems, through innate and learned associations, which place 'the brain in a state where an instrumental response becomes a highly probably outcome (p. 240). This 'motive state… leads to coordinated

[63] See previous chapter (Chapter 6).

information processing within and across regions, and results in the invigoration and guidance of behaviour toward positive goals and away from aversive ones' (p. 247)[64].

The hippocampus, prefrontal cortex and amygdala are core structures in LeDoux's neural landscape and he notes that 'these three brain regions are especially critical to understanding who we are and why we are that way' (p. 295). Given this broader context, LeDoux's primary research interest is fear and the structure most centrally associated with it; the subcortically located amygdala. Across his text LeDoux describes in detail the intricacies of various circuits and, in the process, presents the reader with a complex diagram of interconnections and excitatory and inhibitory influences. Amongst these it is the amygdala's structure that is most thoroughly excavated; a structure of a 'dozen or so distinct divisions' (p. 121), LeDoux touches on six of these. The lateral nucleus is the amygdala's input zone, mediating both defensive reactions and action, and is also the key site in terms of plasticity which means that it is the point for fear conditioning, which is quick, enduring, and acontextual. The central nucleus is associated with innate fear reactions (e.g., increased heart rate) and behaviours (e.g., freezing) and is an output zone, whilst the basal nucleus is associated with fear (instrumental) actions. The medial and posterior nuclei are linked with sexual behaviours, whilst the basolateral nucleus forms part of the motivation circuit. The extended amygdala, or bed nucleus of the stria terminalis, is connected to anticipatory fear responses, that is, anxiety. Apparent in the above is a distinction between reaction and action: The former, associated with classically conditioned (stimulus-stimulus association) or innate responses, is considered primary, whilst the latter, associated with instrumental conditioned (stimulus-response association) responses, builds on the former.

LeDoux describes, through reference to various experiments and observations, how the amygdala was identified as the vital link in the learning of fear reactions; the 'implicit form of learning' called 'fear conditioning' (p. 221). This implies that one 'can undergo emotional learning to stimuli that are never experienced' (p. 219). Though explicit memories 'established during emotional situations are often especially vivid and enduring'

[64] Also see discussion of Damasio's 'somatic marker hypothesis' in Chapter 5.

(p. 221), since '[e]motions, in short, amplify memories' (p. 222). This is because the amygdala 'modulates (strengthens) the consolidation of explicit memories being formed during emotional arousal' (p. 222).

Thus, through the amygdala, 'emotion comes to *monopolise* consciousness, at least in the domain of fear, when the amygdala comes to *dominate* working memory' (p. 226, emphases added). This domination takes many forms; the 'altering [of] sensory processing in cortical areas' (p. 226), the direct influence on the 'medial temporal lobe memory system and thus the memories available to working memory' (p. 227), through the medial (anterior cingulate) and ventral (orbital) prefrontal cortex it is 'possible for implicitly processed (unattended) emotional stimuli to make their way into working memory and consciousness', working memory can also be influenced 'indirectly by way of projections to the various amine cell groups in the brain stem and forebrain that participate in cortical arousal', and, finally, via extra-neural influences 'in the form of sensory messages from internal organs (visceral sensations) or from the muscles (proprioceptive sensations) or… in the form of hormones or peptides…' (p. 228). The influence of the amygdala, as emblem of the subcortical and implicit, is therefore ubiquitous though not necessarily omnipresent. Importantly, it also reveals a neural landscape which is always biased, always under the influence, where there is no pure perception in that only translation (transformation, emotional colouration) exists.

The notion of 'stress' is salient in LeDoux's schema. The term is not directly defined, its ubiquity in common parlance probably assumed to make this unnecessary. In terms of the physiological description provided in LeDoux's text it refers to a particular chain of biochemical reactions in response to the experience of events, such as, feeling 'overloaded' by environmental demands (p. 179). It may be argued that the term functions as a general description for a plethora of distressing, traumatic and oppressive environmental and socio-cultural events, practices, and contexts, reducing the political nature of these 'stressors' to the fairly amorphous 'stimulus'. This allows neuroscience to seemingly unproblematically explore related corporeal responses, as well as to identify individualised resiliencies, without the project being sullied by socio-political contaminants and alliances. However,

of critical interest here is that the detail revealed by this acontextual (reductionist) investigation into this generic responsiveness indicates a soma prone to patterns that decentre consciousness and agency.

As indicated previously, the amygdala's central nucleus can trigger extra-neural responses. In the case of emotional arousal it can stimulate the hypothalamus which then releases corticotrophin-releasing factor (CRF) which affects the pituitary gland which discharges adrenocorticotrophin hormone which travels to the adrenal gland that in turn releases cortisol hormone. Ideally this then causes the hippocampus to stop the release of CRF by the hypothalamus thus regulating the amygdala's response. Chronic exposure to cortisol, due to chronic stress, may however impair the functioning of the hippocampus (via glucose depletion and subsequent glutamate sensitivity), and so severely compromise the formation of explicit memories. Also negatively affected are the prefrontal cortices, this impairing working memory and the various executive functions facilitated by this structure, such as decision making. In fact, prolonged exposure can cause hippocampal cells to degenerate and die and discontinues neurogenesis. In the stress situation the amygdala's function is however accentuated and the fear response is amplified. As a consequence information concerning the stressful situation is mostly stored implicitly:

> The bad news is that if we don't know what it is we are learning about, those stimuli might on later occasions trigger fear responses that will be difficult to understand and control, and can lead to pathological rather than adaptive consequences (p. 225).

Here the split between the implicit and explicit and the dominance of emotion is made vividly manifest. Consciousness, as agency ('downward causation') and as explicit recollection (episodic and declarative memory), is actively excluded, leaving it alienated from the implicit systems whose learning may only be made mysteriously and anonymously visible to us on some later occasion, in hindsight. In this example the materiality and substantiveness of the effects of environmental trauma and oppression is apparent.

As mentioned in an earlier section, LeDoux criticises the constructivist approach for marginalising the subcortical despite evidence of its significant role in structuring of the neocortex. One such form of structuring is referred to as interleaved learning. This is a process where, in the specific case of explicit memories, these are initially stored via synaptic changes in the hippocampus. Each reoccurrence of the situation results in a hippocampal 'reinstatement' where each such 'reinstatement changes cortical synapses a little' (p. 107). The slow rate of consolidation of the cortex is seen as necessary since it prevents interference with previously consolidated memories. Eventually the 'cortical representation comes to be self-sufficient' and 'the memory becomes independent of the hippocampus' (p. 107). This 'nomadic memory hypothesis', involving the 'slow interleaving of information into cortical networks', has received some empirical support (p. 107). In line with this, multiple learning trials spread over time ('spaced training') is found to be more effective than several trials in quick succession ('massed training') (p. 171). Thus, as Connolly (2002) also notes, the neural lies spread across different temporalities as different structures work at dissimilar rates allowing diverse strengths and limitations (e.g., fast hippocampal coarse fickleness versus slow cortical detailed permanence).

The circuits involved in such learning are also dynamic, changing over time: 'Once an emotional habit is well learned, the brain systems involved in expressing it become simpler' (p. 251). That is, previously involved subcortical structures 'drop out' of circuits. Several subcortical examples may be provided: With the amygdala, its emotional contribution (e.g., fear) is no longer required once a behaviour pattern, such as avoidance of a certain situation, is well established. In the case of the nucleus accumbens, it is believed, that it 'trains prefrontal cortical circuits, especially areas of the motor cortex, how to respond' and then 'likewise drops out once the response is learned' (p. 251). Similarly, the hippocampus remains involved with explicit learning until the memory persists through cortical circuits without its assistance. What is interesting about this discourse describing the relationship between the subcortical and cortical is that it positions the former as the teacher of the latter; a mentoring structure that supports the cortex until, through numerous repetitions and across time, the slower structure can integrate the information in detail. Though,

importantly, this tendency is not exclusive to the subcortex; working memory may be involved in the learning of new habits, which 'only later, once routinised, [are] sent to the depths of the mind' (p. 257).

We should recall that there are multiple emotional systems characterised by a relationship where if 'one of these is active, the others tend to be inhibited' (p. 321). This means that 'learning is coordinated across systems in a very specific manner' (p. 322). LeDoux points out that this has consequences for the self that develops; for example, the domination of fear systems instead of 'positive systems' in early development will result in a personality 'characterised by negativity and hopelessness rather than affection and optimism' (p. 322). This of course points to the instrumentality of the surrounding context in the sculpting of the general propensities commonly referred to as personality.

The dominance of the subcortical, specifically emotional systems, such as the amygdala associated fear circuitry, in LeDoux's reading of the nervous system has now been illustrated through a number of examples. The above has shown their primacy in the stress process, in the motivation of the organism to action, and in the structuring of the cortical learning process. Expressed in binary terms this indicates the domination of emotion over cognition, the subcortical over the cortical, and of unconscious processes over consciousness. Where this clear depiction of a split body-subject comes undone is in the closing pages of LeDoux's book:

> Our brain has not evolved to the point where the new systems that make complex thinking possible can easily control the old systems that give rise to our base needs and motives, and emotional reactions. It does not mean that we are simply victims of our brains and should give in to our urges. It means that downward causation is sometimes hard work. *Doing* the right thing doesn't always flow naturally from *knowing* what the right thing to do is. (p. 323, emphasis in original)

The passage can be read as an indication of LeDoux's dis-ease with such a decentring of conscious agency and a subsequent attempt to reassert the conscious subject marginalised

in the text's early pages. The limits of agency, where 'knowing' does not 'translate' into 'doing', are indicated as being due to, what I call, an *en route* brain, one where the 'new' has yet to 'evolve' so as to more comprehensively dominate the 'old'. The ideal is thus still that of complete consciousness and agency; transparency to and control by reason over the 'base' and 'emotional'. In the meanwhile we have to work hard so as to reach down and surmount potential victimhood. This is an odd claim within the logic of the text since the evolutionary and individual utility (in terms of survival and general functioning) of implicit systems is well demonstrated. I would like to argue that this again indicates, as in the previous texts, the presence of a system where binary logic struggles to account for the complexity at hand. To 'resolve' this tension between the 'current' reign of the unconscious and the 'yet to come' of conscious enlightenment and mastery, we need to also consider the closely associated nostalgia for 'coherency' that LeDoux also expresses.

'An imperfect set of connections': Coherence

As the principles described in the opening section of this chapter indicate, LeDoux is especially concerned with temporal consistency and spatial integration which for him lie at the heart of the 'self': 'How does a person with a coherent personality – a fairly stable set of thoughts, emotions, and motivations – ever emerge?' (p. 304). His concern bears resemblance to Goldberg's concern with chaos: 'What makes them work together, rather than as an unruly mob?' (p. 304). The notion of a coherent personality is questionable, and is a reading that finds its ascendancy and dominance within a Western cultural history (Burr, 1995; Cromby, 2007). In the present context I would however like to stay within the logic of LeDoux's answer:

> I believe, in short, that an answer to the question of how our brains make us who we are can be found in synaptic processes that allow cooperative interactions to take place between the various brain systems that are involved in particular states and experiences, and that these interactions are linked over time (p. 32).

Synaptic processes establish a universal form of communication which means that 'all human brains work in basically the same way' (p. 37). These synapses, varying in

‘strength’ based on their histories of activity, establish ‘communities of cells that work together to achieve a particular goal’ (p. 40). The intimacy between this synaptic network and the self cannot be overemphasised for ‘when connections change, personality too, can change’ (p. 307). This however means that the coherence of this structure is based on the delicacy and fickleness of the synaptic connection:

> That the self is so fragile an entity is disconcerting. At the same time, if the self can be disassembled by experiences that alter connections, presumably it also can be reassembled by experiences that establish, change or renew connections (p. 307).

In this sense the vulnerability and plasticity of the synaptic connection are (literally) cast together; disassembly and reassembly can be read as entwined processes, as two sides of the same coin; each resulting in the alteration of what emerges, each involved in the process of destruction/construction.

As noted in an earlier section, internal identity also emerges due to exposure to external consistency; ‘within the brain, a kind of shared culture develops between the various systems because they are exposed to similar environmental circumstances’ (p. 308). Within this context, one where the self is a ‘totality of what an organism is physically, biologically, psychologically, socially, and culturally’, LeDoux indicates that ‘[t]hough it is a unit, it is not unitary’ (p. 31). He explains this reductively at the level of the brain; ‘different components of the self reflect the operation of different brain systems, which can be but are not always in sync’ (p. 31). This lack of alignment is acknowledged in his seventh principle. Consequently, quoting Paul Klee, LeDoux refers to the self as a ‘“dramatic ensemble”’ and, later, as a ‘complex constellation’ (p. 31). And yet he acknowledges that it is because this multiplicity of systems is in interaction that mental integration and coherence is produced rather than the brain remaining a ‘collection of isolated metal functions’ (p. 32). As noted, what makes such cooperation and interaction possible are synaptic processes (connections). So for LeDoux a tension is set up between multiplicity and coherence (singularity); the question then being ‘how the diversity is coped with in the process of keepings one’s self together’ (p. 357).

In the previous section we noted LeDoux's description of an *en route* brain, one where the new (the cortical, the cognitive, consciousness) must still 'evolve' so as to more 'easily control' the 'old' ('base needs', the subcortical, emotions, the implicit). A little later he notes how we are only 'partially effective', as 'explicit systems', at 'wilfully dictat[ing] who we are, and how we will behave'. The reason for this is that 'we have imperfect conscious access to emotional systems' (p. 323). LeDoux then notes the existence of 'multiple independent emotion systems' and how they are 'not always active and have only episodic influence on what other brain systems learn and store' (p. 323).

It is interesting to note in the above, how the self ('we') is equated to the explicit, to consciousness, an equation strongly criticised by LeDoux, rather than the 'totality' of his expansive definition. For me, LeDoux's reference to evolution and imperfection indicates nostalgia for a rather traditional ideality, that of a consciousness that has full access to emotional systems and that of an agency that has full command of behaviour. It is an image of full presence (immediacy) and mastery (control), a perfection that bear a striking resemblance to Derrida's metaphysics of presence. In the absence of this 'yet to evolve' ideal it is the multiplicity (the division) of the subterranean world of emotions, characterised by limited periods of activity and influence, that seems to bring some consolation. It is not the partial and temporary dominance of the emotions that is mourned but that of the explicit, that is, the (singular) consciousness associated with frontal lobe function.

It seems to me to be out of line with LeDoux's image of the self, divided and enabled across the un/conscious, for there to be such a concern with the expansion of consciousness, the colonisation of the implicit by the explicit, an agenda functioning within the constraints of Western enlightenment individualism. It is also an ideality that shows its strained status as its realisation is cast indefinitely into the future by grasping for a teleological reading of evolution. Instead it seems more 'coherent' with LeDoux's expansive notion of self to acknowledge the radicality of the neural's openness to change as well as its intimate embeddedness in, and emergence through, the extra-neural, and to thus take seriously the

profoundness of the effect of the socio-cultural and environmental on this self and its well-being.

Coherency here, in the closing pages of LeDoux's book, seems to involve an inversion; a reduction (or at least a complete subordination) of the unconscious (the multiplicity of implicit systems and circuits) to consciousness (the explicit working memory of the prefrontal lobes), rather than the dynamic coherency sketched across the text, characterised as vulnerable, constantly made anew, prone to imbalance, and marked by the play of partial and passing (implicit and explicit) dominances. Here the prominence of what I call a discourse of power when it comes to describing the relationship between these 'elements' should be noted. For example, working memory is 'indirectly influenced' by the amygdala, emotion can 'monopolise' consciousness, the amygdala may 'dominate' working memory' (p. 226), the accumbens is 'regulated' by the hippocampus and amygdala (p. 271), a brain on antidepressants is 'encouraged, even forced' to learn, the brain may be 'duped' into being plastic (p. 281), the septum 'regulates' some hippocampal activity (p. 286), the amygdala may 'bias' thoughts, decisions, and actions (p. 289), genes 'contribute to, rather than solely dictate' synaptic connectivity (p. 296), working memory 'regulate[s] what we attend to' (p. 316), and independent learning systems can be 'coerced' into learning simultaneously (p. 312). A play of dominances and subordinations, enablements and prohibitions, excitations and inhibitions is consistently constructed across the text; the articulation of a '"dramatic ensemble"'. All such relationships are dependent on the vulnerable and plastic physicality of connection. No structure is completely master or servant, and none are perfectly circumscribed and isolated; none a self determining identity. In this complexity of mutual control, we have both the decentring of leadership and the emergence of identity (coherence) through the play of difference.

It seems hard to overestimate the strangeness of LeDoux's longing for coherence through omniscient consciousness in a context where consciousness is regarded as emerging due to unconscious process[65]. It evokes the image of a snake attempting to swallow itself. Here it

[65] LeDoux possibly also through this ideal wishes to transcend the vulnerability that lies in the very mechanism that enables a self to emerge.

is useful to draw on Wilson's (2004) distinction (as used in her discussion of Freud as neurological theorist) between two types of relationship. In a 'circuit' (be it comprised of neurons, circuits, systems, or systems of systems) the relationship between elements can either be read as 'an assemblage of self-contained elements arranged in determinable relations of cause and effect' (p. 19), that is, 'a complex, yet fundamentally straight relation' (p. 16)[66], or as 'a psychosomatic economy within which the identity of each element… is constituted as an effect of that economic structuration?' (p. 19), that is, 'their relationality [is] somehow integral to their very identity?' (p. 16). As noted, it is LeDoux's central argument that it is the relationship between synapses that constitutes a function and, ultimately, mind and self. Against this logic of identity through difference, there runs another logic, traceable to LeDoux's utilisation and entrenchment in the information processing model of first generation cognitive science[67], the model that he uses to sidestep his 'credibility problem'. This is apparent, for example, in his jarring reference, in a context where 'neural synchrony' (simultaneous activity) creates coherence, to the production line discourse of the 'transfer' (p. 193) and 'storage' (p. 194) of information[68]. Against this nostalgia for coherence as presence (the omniscience and omnipotence of consciousness) and determinist relationships between positive elements we need to read and privilege LeDoux's other discourse, that of coherence through difference, a mutable self through the vulnerability of the synaptic connection, and identity through an un-circumscribable openness to context extending to the extra-neural.

SYNOPSIS

I structure this closing section by using several statements by LeDoux's feminist reader, Elizabeth A. Wilson. In her reading of LeDoux's *Emotional brain,* Wilson (2004) is intrigued by his delineation of multiple emotional systems in that this not only suggests a surprising richness of possible interactions between these systems (e.g., what is the effect of

[66] This is what Cromby (2007) refers to as a causal metaphysic.

[67] See Chapter 3.

[68] The simultaneous presence of conflicting discourses is also discussed in the (mis)reading of Damasio's *Descartes' error* in Chapter 5.

fear on rage?) but also between these systems and various cognitions (e.g., do certain beliefs align, suppress or partially associate with certain emotions?). She also argues that our shared physiology with other species disrupts new (mammalian) and old (reptilian) cortical distinctions thus troubling a simple hierarchical reading of evolution. Although not developed in detail, she states that this complexity provides a fertile ground for feminist agendas (Schyfter, 2007). The reading of LeDoux's *Synaptic self* provided in this chapter has hopefully demonstrated a similar potential for critical projects.

Referring to Freud's early work, Wilson (2004) argues that '[c]harges of neurological determinism inadequately grasp the ontological and relational complexity that this… model entails' (p. 20). Likewise in LeDoux's text a simple determinist reading of neuroscience is challenged by indications of a genetically determined plasticity (an innate openness exploited by both genes and the extra-neural), of an innateness that does not escape interpretation (that is, a pragmatic utilisation of neural corporeality that undermines attempts to assert a predetermined functionality), and of an epigenetically determined dynamic foundation upon which a body-subject is constituted.

Wilson (2004) also declares that, in 'early Freudian maps', 'neurological matter is more confident, flexible, resilient, and assertive than most critics have yet acknowledged; she finds here a 'model of a vigorous (rather than dictatorial) neurology' (p. 22). Similarly, LeDoux's neural landscape is one where vulnerability and plasticity form two sides of a malleable and generous neurology, a plasticity that enables a play of difference between synaptic connections where materiality and emerging functionality are intimately entwined. It is a vibrant materiality where functional stability has to be constantly resurrected in each instance of activity. It is also a prolific materiality crafted through a complex and intimate relationship with and between the extra-neural, the genetic and the random. Furthermore, it is an always biased landscape, never pure and objective but always coloured (constituted) by the partial and temporary dominations of cognition and emotion.

In this chapter I have also tried to argue for a reading of reductionist neuroscience that positions the project as both necessary and impossible. That is, that it is a necessary

endeavour where critical reflexivity is essential as the parameters of claims always exceed their authority. Part of such a reflexive position would be to bear in mind that the brain is a necessary condition for self but that it is certainly is not sufficient to account for our complexity. This is apparent in LeDoux's text as an overtly declared neural reductionism is inverted through his positioning of the social. What emerges is a mutual contamination between the biological and social, where neither can be rendered in pure form. With regard to efforts to distance neuroscience from the subjective other, the so-called credibility problem, this again demonstrates that such efforts are inevitably undermined by a necessary alliance with the ostracised element.

Also illustrated was a dominance of the explicit (consciousness) by the implicit (unconscious processes), where, for example, the effects of 'stress' decentres attempts at self-awareness and agency. LeDoux's effort to invert this hierarchy by reasserting the 'yet to come' cogito in the midst of such a subcortical usurpation obscures a dynamic and complex set of relationships between structures/functions. His seven principles demonstrate a primary concern with cohesion; the integration and co-ordination of a multiplicity so as to produce the singularity of a self. His attempt to achieve this through the aforementioned cogito-centrism obscures the vulnerable yet dynamic cohesion that is achieved through plasticity and the subsequently enabled play of difference, where identity is contextually determined. As Wilson (2004) indicates in her discussion of the relationship between biology and psyche, where typically 'the first term prescribes and subdues the second term'; what actually emerges is 'a system of mutual constitution from which no term emerges as the originary, predetermining term' (p. 19), rather we have 'a mutuality of influence, a mutuality that is interminable and constitutive' (p. 22).

Wilson (2004) refers to how 'the unavoidable, unsettling, difficult to resolve character of neurology is articulated by [the psychologist] Kramer through close empirical attention to neurology itself' (p. 27). What the above attention to the intricate neural detail described in LeDoux's text has demonstrated is a neuroscience under erasure: A science where attempts to enforce a binary logic, through which pure instances of a notion may be produced, inevitably acts as grounds to assert the contrary of a statement indicating not an erroneous

hierarchy but a complexity that always exceeds the binary logic used to understand and control it.

Finally, in attempting to illustrate the value of a close engagement with the intricacies of neurology, it is important to remember Foucault's point that new knowledges are not essentially emancipatory but that all transformations bring about new freedoms and dangers (Dreyfus & Rabinow, 1983). As Rose (2007) points out, the increasingly molecular view of life in contemporary society brings with it new regimes of objectification and subjectification, where the individual is expected to take on new responsibilities in terms of self-surveillance and intervention. These knowledges bring about the fabrication of a contemporary self from which critical reflection, opposition, intervention and utilisation should never be absent.

DISCUSSION

CHAPTER 8
CONNECTION, IMPLICATION, LIMITATION

> Taking liberties with Derrida's celebrated deployment of Saussarian linguistics, I argue that "[a biological entity] is never present in and of itself, in a sufficient presence that would refer only to itself. Essentially and lawfully, every [biological entity] is inscribed in a chain and in a system within which it refers to the other, to other [biological entities], by means of a systematic play of differences… In [biology], in the system of [biology], there are only differences" (Derrida, 1982, 11).
>
> (Wilson, 2004, p. 110)

INTRODUCTION

This project forms part of a larger venture that seeks to refigure the biological in a way that it acts as a source - complex, excessive and perverse - for its own rethinking (Keane & Rosengarten, 2002). Rather than science being exclusively an agent of social control it is regarded as having the potential to contribute to the critical agenda, though not in a simple supplementary fashion but through the refractive procedure of deconstruction (Wilson, 2004). In this regard, Wilson (1998) emphasises three implications of deconstruction; i) the negotiation of the necessary and the impossible, ii) the problem of solutions (finality), and iii) the need to acknowledge complicity. The theme of complicity is addressed in chapters one and four, whilst the notion of aporia is articulated repeatedly across chapters five, six and seven. It is in this final chapter that the desire for solutions and final syntheses (closure) is eluded in favour of the articulation of the openings that the (mis)readings of the neuroscience texts revealed and how these speak back to the concerns and themes of body studies and the critical agenda.

The chapter is structured in terms of a number of topics. In the first the notion of intimacy is used as a base. This notes the shared emphasis on material-functional intimacy across the three (mis)readings. This is developed by being linked to connectionism, specifically the conjunction, in several texts, of neural nets to post-structuralism. The second theme addresses several binaries and spectres identified as problematic in critical psychology. This draws in a number of emphases from recent work in body studies which lay more stress on the extra-neural, that is, the body and environment. All of the above allow me to

reflect on various commonalities across the readings and predominantly addresses the first three objectives specified in the opening chapter. The remaining topics all involve standing further back from the project, locating it within the larger political and disciplinary context, this speaking more directly to the fourth objective. The next theme considers the critical agenda and addresses concerns regarding embodiment work and connectionism in relation to the promotion of emancipation. In the final section, a reflexive turn is taken, which reflects on the use of deconstruction in this project, the neuro-centrism inherent in the articulation of the thesis, and the myth of atemporal unity that dictates expeditions such as this one.

AN INTIMATE CONNECTION

Cilliers (1990) traces the idea of using neuron-based structures in the development of computation (specifically artificial intelligence) to the 1940s. Initial implementation followed in the 1960s but only in the 1980s did neural networks come into being as a substantial multidisciplinary field. Harré (2002) regards the great advantage of such models as their metaphysical plausibility, that is, they are modelled on the functioning and structure of actual neurons in the nervous system. This contrasts with the von Neumann machines used in traditional cognitive science[1], where information (as representation) is processed (manipulated) sequentially by a central processor through the use of algorithms (software programs) running on hardware. Connectionism or 'parallel distributed processing' (PDP) challenges various aspects of this traditional model, consequently giving rise to vociferous debate and several attempts at rapprochement and clarification (Cilliers, 1998; Smolensky, 1988).

Neural nets take the form of a network of parallel and sequentially interconnected units which, like neurons, receive inputs from and send outputs to other units. Inputs may be inhibitory or excitatory, either preventing or enabling the activation of the unit, and are analogical in effect; each incoming impulse being summed with others. The activation of

[1] See discussion of traditional cognitive science in Chapter 3.

the unit depends, in models based closely on real neurons[2], on reaching a pre-set threshold whereupon the unit 'fires' (Harré, 2002), such activity being digital (or binary), that is, either present or absent (Cilliers, 1990). Connections between units are described as having a 'weight', which may vary over time according to its history of activation and indicates the level of influence a unit has on other units (Wilson, 1998). Taken as a whole, the network also receives inputs and emits outputs, consisting of an input surface, an output surface, and variable layers of 'hidden' units (Harré, 2002). All activity is transmitted and transformed in a non-linear fashion across this structure which consists only of these simple elements (Wilson, 1998). A network can then 'learn' by being 'trained', this involving inputs being repeated until a specific output is achieved (Harré, 2002). The important point is that this only entails the repeated adjustment of connection weights until the net is said to 'hold' the information as it 'settles' into a solution.

This simple architecture contrasts with the von Neumann machine in several important ways: Instead of algorithms or comparative prototypes being stored in the network architecture, there exist only varying weights across numerous connections (Wilson, 1998). This indicates the absence of a top-down regulatory structure (the central processing unit) and the presence of a non-hierarchical architecture where 'information' is stored in a non-iconic and distributed manner (Cilliers, 1990). This means that there is no 'representation' of external information in a simple locatable manner. Instead of any such positivity, there are only relational effects emerging from differences between the weights that comprise the network; the individual weights of connections between the structurally identical units having no significance intrinsically. Information therefore does not flow in a simple linear fashion across the network but is propagated across time and space in a distributed and parallel (simultaneous) fashion.

Connectionist models challenge the dualisms of von Neumann machines: In a system where information is embodied in the architecture, where it is 'materially instantiated' (Wilson, 1998, p. 160), the distinction between software (mind) and hardware (body) cannot hold.

[2] There are a diversity of connectionist theories, architectures and parameters (Cilliers, 1998; Smolensky, 1988). Here I will only focus on models based closely on the architecture and propensities of real neurons.

Similarly, given the absence of algorithms, the distinction between syntax (formal rules for symbol manipulation) and semantics (representation of external objects) breaks down since 'the two are folded into each other in an inextricable way' (Cilliers, 1990, p. 7). Connectionist models hence do not share traditional cognitive science's use of a linguistic model (Canfield, 1993), what Smolensky (1988, p. 3) refers to as the 'symbolic paradigm'.

Several writers have attempted to articulate a 'kinship between neural networks and post-structural models' (Cilliers, 1990, p. 7), this resulting in comparisons (Canfield, 1993), mappings (Globus, 1992, 1995) and supplementary juxtapositions (Cilliers, 1989, 1990; Wilson, 1998). Such exercises, predominantly drawing on Derrida's readings of Freud and Saussure, have followed a number of agendas. For the purposes of this project I will focus here only on the readings by Globus (1992) and Wilson (1998).

Globus (1992) argues for the replacement of the 'metaphysical brain' of the 'computational theory of mind'[3] with the 'spontaneous, unpredictable, self-organising, holistic processes' of the 'deconstructed brain' (p. 193). Wilson (1998) has been critical of this reading, arguing that deconstruction does not position itself in opposition to metaphysics, this relationship being more than one of simple antagonism[4]. Furthermore, Globus pursues a straight forward empirical agenda, trying to recognise deconstructive notions in neural models, where 'the connectionist network is the scientific instantiation of *différance*' (Wilson, 2008, p. 25). Here then, in a generalised and routinised reading of deconstruction (as model), we find the typical concerns with progress, synthesis, innovation, method and truth (solutions) of mainstream science. These are fixations which, as discussed in Chapter 4, deconstruction is wary of. For Wilson connectionism is not a more truthful version of cognition that enacts a radical break from the constrictions of traditional models. Truths are always misreadings-in-waiting whilst radical breaks, although possibly useful, are 'always, and fatally, reinscribed in an old cloth that must continually, interminably be undone' (Derrida, 2004, p. 22). Believing that one has found the Promised Land usually

[3] Wilson (1998) points out that, given its concern with software, there is no brain or neurology in traditional cognitive science.

[4] See Chapters 1 and 4 for discussions of deconstruction's relationship with metaphysics. The complexity of this relationship is also returned to later in this chapter.

means that criticality is suspended allowing, as discussed in Chapter 1, the deployment of the theological violences of the *belle me*.

Like Cilliers (1990), Wilson (1998) proceeds through a juxtaposition of connectionism, Freud's reading of neurology, and Derrida's reading of both Freud and Saussure. For her, 'Freudian, Derridean and Saussurian tools are necessary to deploy adequately connectionist theories as a critique of traditional cognitive morphology' (p. 168). Her ambition is one of a negotiation that troubles, rather than conflates or inverts, the binaries operative in cognitive science and in this way to re-orientate such projects. She tracks the 'cognitive trace' from cognitive science to structuralism to post-structuralism. In cognitive science the trace, although necessarily inferred, is assumed *a priori* to be a constitutive entity that is empirically present and locatable, a discrete psychic thing which is stored until simply reactivated. A distinction between physiology and psychology, the neurological and the cognitive trace, and a consequent disembodiment, is maintained.

In Saussure's linguistic structuralism we find the idea of location troubled as the trace is dispersed, its identity emerging via patterns of difference. This bears a resemblance to the distributed 'representation' of connectionist models, although not completely. Wilson considers such a reading as problematic since the trace remains an inert and brittle notion. Ultimately what is reintroduced is the idea of a locatable trace only now in dispersed locales. The system constituted by such a trace is one in perfect equilibrium, a closed and stable system (Cilliers, 1990). The challenge to such an organization is introduced through Derrida's destabilising reading of Saussure's structuralism. Here meaning becomes the effect of the 'play' of signifiers, articulated in the notion of *différance*, rather than being 'determined' by the relationships between signs. As discussed in Chapter 4, meaning is then never fixed or finalised but is always on the move (deferred) in a set of dynamic relationships between traces which are both active and passive, present and absent, subjugating and subjugated, spatial and temporal, differing and deferring.

Freud's reading of neurology, developed in the *Project for a scientific psychology* (1895), bears a remarkable semblance to the above (Cilliers, 1990). Stated briefly, the nervous

system is comprised of neurons and the connections between them. The connections of the Ψ (psi) or psychological nervous system are characterised as resistant, repeated use allowing the 'facilitation' of the transfer of energy or quantity. As with Saussure's diacritical notion, it is through such varying facilitations that patterns of difference are established which determine the characteristics of the 'mental apparatus' (p. 2). As with connectionism, stimulation (input) acts only by 'breaching' open new routes, these physical pathways constituting the memory (storage) of the system. Resonating with this materialism is that stimulation has no ideational content but is comprised only of bits of quantity. Freud continuously opposes the notion of location but not in the form of a simple inversion where mobility becomes dominant. Instead of a simple negative critique, he does not allow topography or force to claim purity. Thus, as '[n]either fully present nor absent, neither freely mobile nor totally static' the trace becomes undecidable (Wilson, 1998, p. 186). Freud's concern with mobility is motivated by his understanding that the nervous system must both *divest* itself of energy (quantity), so as to prevent injury, and *maintain* a reserve of energy in order to deal with the unexpected demands of life, those that require the higher cognitive functions (Cilliers, 1990; Wilson, 1998). This results in a continuous dynamic process of negotiation where this potentially toxic energy is 'managed' by being kept as low as possible and by being continuously deferred.

Derrida's take on Freud rests on his utilisation of the notion of 'breach' instead of the standard translation of the German *Bahnung* as 'facilitation'. This allows him to set into play (without resolution) the dual meaning of breach as both action (force) and space (the place cleared by this force). Thus the constitution of the psyche is not to be found in the locatable and present (static) trace but in the difference between breaches forever on the move. For Wilson, Derrida's reading makes more apparent how Freud's neural system is enabled by difference and deferral. She however identifies in Derrida 'an unargued but constitutive antineurologism', a distancing that characterises Freud's theory as a 'neurological fable' (Derrida, 2001, p. 251). His interest instead is to trace 'a metaphorics of the written trace' as it develops across Freud's writing from the *Project* onward (Derrida, 2001, p. 251). Wilson argues that by founding his reading on an anti-biological moment, Derrida limits its critical effectiveness in reading neurology.

Wilson (1998) aims to articulate 'the material and mobile nature of the psyche, but without an imperative for locationism and [neural] reductionism' (p. 180). The trace is thus material but still slips beyond being intelligible and sensible, being both ungraspable (requiring us to think both force and place) and beyond location (as always deferred), thus undermining both positivist empiricism and anti-neurological idealism. Significantly, this articulation of mobility allows Wilson to displace neural matter from being inert and passive to being, what she calls, 'libidinal', an 'affective movement', giving rise to neural matter that is not secondary, animated by exterior forces, but an affective biology that is 'the very stuff of cognition and neurology' (p. 204). In this scheme connectionism becomes 'an instantiation of these principles in a manner that is coherent to scientific psychology' (Wilson, 1998, p. 189). Where is location in a brain which uses the same neurons (sites) for different purposes, where patterns criss-cross and their traces only become 'visible' for the instant of their activation? Connectionism must however remain in juxtaposition with Derrida's and Freud's notions since being part of the mainstream discipline it remains prone to return to static readings through attempted rapprochements with traditional cognitive science (Cilliers, 1990; Wilson, 1998).

The introduction of, what Cilliers (1990) calls, 'post-structural neuropsychology' at this point of the project has consequence in the form of what Freud called *nachträglichkeit;* a retroactive effect which resonates with and mutually transforms itself and the previously presented (mis)readings. There are two important contributions to take from the above: First, a notion of architecture where rigid distinctions between software and hardware, mind and body, cognition and neurology, no longer hold as the former is indissociably materially instantiated. Second, a notion of mobility which reinvests the neural with vitality; no longer requiring it to await extra-neural animation, but making it a force that allows the psyche to come into being. The utility of these points for this particular project is made visible by juxtaposing Cilliers (1990) and Wilson's (1998) readings with those of Damasio, Goldberg and LeDoux. This also then highlights the contributions that the latter can make to the former.

Globus (1995) warns against a conventional form of connectionism, one which returns to its articulation an iconic type of representation, the symbolic form utilised in traditional cognitive science, that now 'hides out in the whole' (p. 72). 'Radical connectionism' posits that there is no 'representation' as such but only a dynamic process constrained by its inputs. The term's dismissal has been suggested by others (e.g., Bennett & Hacker, 2003; Cilliers, 1998) but the casting out of a name does not prevent the return of the idea. The dynamics of the 'microstructure of cognition' (Wilson, 1998) unpacked above acts to supplement an adherence to connectionism identified in the texts of Damasio, Goldberg and LeDoux. As much as lack of detail leaves space for the return of demobilising conventions in these texts, usually in the form of the discourse of traditional cognitive science, it is simultaneously an opening for more critical appendages. The (mis)readings of this project have generally attempted to place these texts into motion and play, away from the pacifying circumscriptions of binary distinctions.

Commenting on Smolensky's (1988, p. 1) 'proper treatment' of connectionism Lakoff (1988, p. 39) points out a 'huge omission: the body'. Connectionist systems function and are able to be meaningful within a very specific relationship, or input constraint, that of the sensorimotor system of the body. This is an important point that acts against neural reductionism and a Cartesian neurology. The (mis)reading of *Descartes' error* becomes salient here as it is here that mind is most explicitly conceived as an emergent property of an ever-changing and environmentally embedded organism (comprised indissociably of brain and body) via continuous reiteration and the synchronic and diachronic juxtaposition of activity across multiple structures. This points to the fact, also described in the Damasio chapter, that a neural network is an open system, where activity has no meaning on its own but only through its relationship with other aspects of the context (Cilliers, 1990). We do not simply experience the world but emerge through our complex interaction with the world where we transform it and it transforms us (Cilliers, 1998). Furthermore, given the (aporetic) intimacy of this embeddedness, the notion of 'representation' looses its iconic nuance, the distinction between concept and context breaks down.

Across all three (mis)readings we find the theme of material-functional intimacy. This is not surprising since, as LeDoux (2002) notes; it is *the* founding assumption of neuroscience. In this respect Damasio, Goldberg and LeDoux all draw on the notion of emergence, which as discussed in Chapter 2, is a commonly accepted idea in current neuroscience. It is also an essential aspect of connectionism, where the 'characteristics of the system emerge as a result of the *différance* of traces, not as a result of essential characteristics of specific components of the system' (Cilliers, 1998, p. 45). What the (mis)readings make apparent and elaborate are the play of differences on a structural level and the role of other aspects of corporeality and the environment in emergence.

Harré (2002) emphasises that neural networks are models and should not be confused with 'real nets of real interconnected neurons in the brain and nervous system' (p. 190). He indicates several limitations of such models: First, the chemical (molecular) aspects (in which we may include genetics) of the nervous system are marginalised in model nets, an aspect addressed in this project in some detail in the chapter on *Synaptic self*. Second, although some regions of the brain are net-like such as the cortex[5], there are other regions where such architecture is less apparent. This draws our attention to the fact that the brain consists of more than a microstructure but also of macrostructures. This level is the focus of much neuroscience and it is thus important to critically evaluate such models. The report's (mis)readings all include substantial discussions of the dynamics at work at this level. Finally, Harré points out that neural nets require an external teacher who monitors outputs until a correct version emerges. The fact is that humans also engage in self-instruction and monitor their own performances. He indicates that in a system of neural nets the existence of such a monitoring function is not hard to imagine. Here the notion of an executive, which is emergent, constrained and recursive, is addressed in the chapter on Goldberg's *The executive brain*.

[5] See Chapter 6 for Goldberg's description of sub/cortical architecture.

COMMUNING WITH SPECTRES

Blackman (2008) in her critique of dualisms echoes Derrida's appraisal of these structures; they insert a separation between the two terms, simultaneously imposing a hierarchy and an interaction problem. As a hierarchy, the primary term is superior, complete and the norm, and the secondary term is inferior, supplementary, and the Other. As distinct terms the question arises as to how such entities can interact, how a relationship can be convincingly articulated. For Blackman, within the context of body studies, this necessitates the elimination of dualities, a call for an embodiment paradigm that 'refuses the idea that the biological and social, the natural and cultural, exist as separate entities' (p. 37). If this implies monism[6] then this buys into the fantasy of escaping the metaphysical closure. Instead we must operate within the logic of contamination, an essential law of impurity, where the terms operate as a constitutive mutuality (Canfield, 1993; Staten, 1984; Wilson, 2004). Interestingly, this is the outcome of Blackman's review of embodiment work; relations between terms emerge as entangled, complex, interdependent and enfolded. In this section prominent binaries, embodiment themes and the spectres that haunt them are weaved together with the (mis)readings of this project.

The quintessential dualism, the Cartesian spectre that haunts the Western academy (Žižek, 2000), the one to which Damasio dedicated a title and a book, the one to which substantial space is dedicated in Chapter 2 and which is addressed again and again across the (mis)readings, seems to find its final consideration in the preceding section. It is expressed through a number of *nom de plumes*, all imposing a similar structure and problematic; whether expressed as mind/body, self/body, software/hardware, or cognition/brain, what is found are relationship questions whether in the form of the representation problem (concept/context), questions of location (inside/outside), or the nature of this interiority (surface/depth). In the previous section an enfoldment is articulated through a juxtaposition comprising a mobile connectionism. A reading of Damasio's text provides the image of an indissociable intimacy from which mind emerges, the separation between cognition and

[6] The proposed escape, as we will discuss, is actually to multiplicity, one that does not actually transcend dualism.

physicality is troubled in reading Goldberg's distinction between brain and brawn, whilst LeDoux's teleological nostalgia is disrupted to keep in place his emergent unity which is not unitary. And yet what these references make apparent is that this distinction is never left behind, consideration is never final, since the problematic is continuously reasserted, needing address interminably. The reason for this is not only that its troubling must always rest in the dynamics of juxtaposition but that it is always present in the play of other binaries and themes. If, as connectionism argues, mind is emergent and therefore bears a remarkable resemblance to the dynamics of language then we must once again note Derrida's important point that '[m]eaning is context bound, but context is boundless' (Culler, 1982, p. 123). Functions may be traced to circuits but the edges of those circuits are boundless, spilling into other circuits, other organs, other spaces, others. No clear and final line can be drawn, since the boundary is always deferred, always on the move. As such, the understanding of mind cannot stop with its material instantiation in the dynamics of neural connections, but must extend to other relationships. It is for this reason that the question of mind is present in all the other themes considered here.

In body studies a corporeality that is multiple and open is celebrated (Blackman, 2008; Blackman et al., 2008). This multiplicity is expressed through a number of entwined themes. The one, referred to here as the *embedded body*, accentuates its socio-historical location. Drawing on sociological analyses, anthropological ethnography and historical scholarship, a malleable body is revealed, one showing remarkable variation across time and context. It is also then a body that cannot be separated from or understood outside of its surroundings. For example, as per Foucault, the body is disciplined into morphologies and confessed into subjectivities through power/knowledge, that is, social 'structures', or, as per Bourdieu, a habitus is inculcated through social processes which allow varying forms of capital in different social fields. A body then emerges that is classed, sexed, raced, etcetera. For some disciplinary society has been left behind in the passing of industrialisation, the emergence of complex information networks establishing a society of control where the body-subject is constituted and regulated in diverse and nuanced ways unimaginable in modern institutional society (Hardt & Negri, 2000)[7]. With the *extendable*

[7] This point will be elaborated in the next section.

body[8], corporeality's boundaries become fluid as, noted by Merleau-Ponty, the technologies it utilises expand beyond mere additions to prostheses that trouble the dermis as limit. More radically, recent work construes the body as more than a variable perimeter but as a changeable identity emerging through its immersion in assemblages (Blackman, 2008). Any claim to essence is troubled as the body's conjunctions with objects, technologies and others are contingent, that is, temporary and situated, and thus endless in possibility (Marcus & Saka, 2006). Acknowledging the stability of structure, multiplicity and fluidity are accommodated as a body-subject constantly emerges through subtle shifts in context. In considering both of these themes the issue of the *vital body* becomes relevant; the concern with articulating a body that is not merely the product of social processes, an inert and passive substance awaiting external animation, but rather one that is capable of activity, an agency that is then more than one equated with intentionality and consciousness.

These concerns with embeddedness, extendibility, and vitality arise from a critical engagement with a number of related binaries that extend beyond the neural and the dermis, one that ruptures an individualism narrowly conceived - those interpretations that attempt to restrict concern to functional/neural couplets or acontextual cognitive processes. Here we may include such oppositions as: natural/cultural, biological/social, nature (genes)/nurture, naturalism/social constructionism, individual/cultural, and natural/technological. This risks the establishment of two forms of determinism; biological reductionism (biologism), where the biological determines behaviour, and social determinism, where the social moulds a passive biology. In either case, the particularity of the one becomes the product of the universal influence of the other.

For Damasio, the environment cannot be excluded given an indissociable intimacy with the organism where, for example, learned emotional associations act to censure the options that enter consciousness, thus enabling social competence. Despite such ambitions, Damasio

---

[8] Here I specifically focus on the spatial dimensions of the body although, as the notion of assemblage indicates, such a restricted focus is difficult to maintain. The temporal aspects of the body are addressed more directly in the *enacted body*.

still attempts to delineate a pure or pre-social emotion, instinct and sensation, endeavours that are always troubled by the irreducible presence of the social. For Goldberg, the social moulds the gradiental cortex, where the orderliness of the frontal lobes is linked to the structure of the environment. However, such structuring is censored by the 'uncivilised' other; non-frontal structures that, should we think of the social longitudinally, themselves ultimately emerge through their own embeddedness in the environment. Goldberg's return to clear social-environmental distinctions is troubled in their moment of (discursive) making, whilst attempts at demonstrating the intimacy between sex and cognitive styles express the radicality of environmental embeddedness. With regard to LeDoux, his explicit commitment to neural reductionism only demonstrates an indebtedness to the social, where the external world structures the exuberant internal. Expressions of innateness (genetic determinism) are troubled by genes enabling plasticity itself, by the intimacy of epigenesis, and by the innate never transcending the interpretation of practical utilisation (exaptation).

What is illustrated across all these cases is an intimate and open relationship with the environment, one that does not simply submit to accusations of asocial individualism, or biological determinism and reductionism, that is, the essentialism of biologism. Although an exuberant materiality does not necessarily counter such a claim, this does not inevitably imply a social determinism. As Grosz (1994a) points out; the body presents us with a malleable materiality 'well beyond the tolerance of any culture' and its conceptual frameworks (p. 140). The relation between the biological and the socio-environmental is one of notable complexity where, as the (mis)readings presented in this project show: 'Biology's outside is already within, its interiority always scattered' (Wilson, 1998, p. 65). Such complexity and (aporetic) intimacy troubles any attempt to establish a simplistic divide between a biological inside and a socio-cultural outside, where the former is rendered closed and complete. This also does not imply a conflation or monism where the biological is simply social but, rather, an acknowledgement of how constitutively porous binary boundaries are (Keane & Rosengarten, 2002). If you are looking for where the social terminates, where the 'outside' stops penetrating the 'inside', then you will have to follow these tendrils to unexpected depths to the point where you realise that the question no longer makes sense. And if you follow the body, as extension, as assemblage, as

network, and as vitality, beyond the conventionalised wrapping of the derma, you will inevitably run only into other bodies and biologies.

We are dealing here with more than complexity in a modernist sense (what Cilliers (1998) would call a 'complicated' relation), where self-present elements lie in a tangle of causal (ultimately straight) liaisons, but a co-constitutive relationship (Wilson, 2004). As is echoed across the (mis)readings of Damasio, Goldberg and LeDoux, form as that which enables identity emerges through location in a larger (material and dynamic) context:

> [T]he identity of any biological entity (organism, organ, cell) is to be found in the movement of relationality – between individuals, within individuals across time, within groups, between organisms and their environment, among body parts, across cell membranes (Wilson, 2004, p. 109).

The effect of this is seemingly contradictory; as Kirby points out: 'Identity is inherently unstable, differentiated, dispersed, and yet strangely coherent' (cited in Barad, 2003, p. 828). Where relationship, the essential shimmer of difference, is fundamental to identity, attempts to discern clear divides and to determine essences within such distinctions is an (unavoidable) act of political violence. Wilson (2004) points out that the social contextualises the biological just as the biological contextualises the social. The neurological project as the circumscription of Truth, the determination of fixed linkages and the comprehensive compilation of final statements, is a deluded reading of the project. Referring to Derrida's consideration of French interpretations of Nietzsche, Gasché (2000) points out 'there is no such thing as a unique and fixable meaning of Nietzsche' (p. 140). This is, of course, a statement not particular to the work of this philosopher or even the nature of writing in the narrow sense, but indicates a more general condition. However, the neurological project as engagement with the complexity of neurology (a materiality always open to and entwined with the other, the extra neural) is essential, worthwhile and interminable, both to neuroscience itself and any other project that claims the body-subject as part of its concern.

Attempts to draw clear distinctions between human and non-humans, specifically humans and animals, are also troubled by attention to neurological detail. Goldberg's reading of the left and right hemispheres as being fundamentally structured by routine and novelty disrupt attempts to position language as an essential and definitive function of the human left hemisphere. Instead we share with other mammals a neural architecture which allows the establishment of routinised code. In the same way, as LeDoux shows, we have neural chemistry, plasticity and unconscious processes in common with a myriad of other species. Thus a neuroscience methodology, originally founded on ethical considerations and assumed commonality, demonstrates linkages that continue Darwin's project of bringing us down to earth. It troubles an attempt to equate animal biology (usually associated with the human subcortex) with the rudimentary and human biology (associated with the cortex) with complexity, instead revealing a common complex animality (relationality). What's more, the social[9], following Damasio, is not something special to humans but extends to monkeys and birds, an observation that suggests a common sociality that is foundational in the establishment of instincts.

The concern with the relationship between agency and structure is a foundational problem in the social sciences manifesting in a garb of binaries: voluntary/automatic, purposive/non-purposive, will/nature, agency/regulation, active/passive, personal/impersonal, freedom/ determinism, and centre/periphery. For Damasio, agency, and its definitive function, reason, are enabled by the censorship and guidance of emotion. The choices we are faced with always already show the impact of a corporeality marked by experience. Similarly, Goldberg's executive is able to manage various cognitive and other corporeal processes but is an intentionality that functions within a system where its omnipotence is enabled and decentred through a myriad of changing relationships with other structures. Also for LeDoux, downward causation (equated with consciousness) is 'monopolised' by implicit emotional processes that bias its content and atmosphere. Agency as conscious contemplation and enactment may be an essential process in social survival and prosperity, but it is a function that emerges from an unconscious multitude, a dynamic structure crafted

[9] I am aware that the 'social' is commonly associated with animals, including ants and bees. What I am trying to emphasise here is its foundational role in phenomena typically cast beyond the social.

by individual and trans-individual experiences, which cast it from its throne as sovereign both generally, but especially, as LeDoux shows, in times of trauma. As Wilson (2004) found in her readings of Freud and Kramer we find in this set of engagements; attention to neurological detail undermines classical neurological determinism (p. 27). The causal metaphysic must proceed within the play of *différance*, a logic of difference and deferral that undermines simplistic causal routes, innate origins and autocratic centres.

Recent body studies also foreground the temporal aspects of the soma in discussions of the *enacted body* where corporeality as process is emphasised (Blackman, 2008). Here again the malleability of the soma comes to the fore as the body is always an *en route* materiality, forever unfinished and in the process of becoming. Notions of stasis are cast aside as the body is performed into being. Essential to this is that the body is open to that beyond itself, interest in the *communicative body* revealing the ways our corporeality is able to engage with the other in ways beyond the emphases on discourse developed by the turn to language. Here we find the turn to affect and non-conscious processes, studies of how the body is affected and affects others, resulting in, for example, synchronised and attuned bodies (Blackman et al., 2008). Biology finds a role here in the recognition of the role of hormones in such subtle and powerful forms of communication (Brennan, 2004). In neuroscience we find a striking similarity to body studies in turns to emotion and unconscious processes. In Damasio's text the re-engagement with emotions is justified on both methodological grounds and in its ability to articulate a rationality that is more ecologically valid. LeDoux's emphasis on unconscious processes, especially multiple emotional systems, allows him to articulate the process in which the synaptic self is constructed.

Across the entwined themes of social sciences' body we can discern the emergence of a set of contemporary emphases in understanding corporeality: This includes conceptualising it as dispersed, interconnected and multiple rather than rendered in dualistic or singular terms (Blackman et al., 2008). The open and 'molecular' body in process, relation and flux is preferred and pursued rather than a 'molar' substance that is fixed, static and closed. Such an emphasis on a multiplicity in motion constitutes a body where tension and contradiction

cohabit in the same substance and the question then becomes as to how a unity or coherence emerges or is achieved from such a 'dramatic ensemble' (Blackman, 2008). In this report we also find a mobile neurology from which a coherent stability needs to emerge. The (mis)readings of Damasio, Goldberg and LeDoux all disrupt attempts to place cold hard reason (and its neural castle, the cortex or, more specifically, the prefrontal cortices) at the helm. Such a physical and functional hierarchy is troubled by a mode of power that is not so easily locatable, as dominances are always at play, influences always on the move. Damasio's body is a dynamic homeostatic corporeality, where mind and subjectivity emerge through a continuous process of reiteration and reconstruction that allows a subject to be in touch with the contingency of its circumstance. The brain in Goldberg and LeDoux's texts is characterised by a continuous play of dominances between brain structures, where any foundation is momentary, provisional and contingent and, accordingly, any coherence is a momentary achievement. LeDoux's attention to micro-particulars reveals a stability in function and recollection that depends upon a continuous process of molecular reiteration. These relationships between brain structures are also typified by a multiplicity of temporalities: Goldberg's left hemisphere lags behind the right as it lays down more detailed codes for routine action, Damasio's emotional processes act quickly laying down a template for reason to work with, and LeDoux's subcortical structures work fast, laying down poorly contextualised associations while acting as scaffolding for more thorough cortical inscriptions. Importantly these varying temporalities set up diverse sedimentations of dissimilar endurances that act as sets of mutual constraints, tensions through which survival is enabled. I take up this point again shortly.

Blackman et al. (2008) respond to this 'widespread contemporary tendency within the social sciences to simply avoid, by largely rhetorical means, the phenomena of fixedness and continuity' with concern (p. 19). For them the celebration of fluidity and multiplicity fails to recognise the socio-political context of many who have to deal with continuous and stable oppression and exploitation[10]. As Hardt and Negri (2000) point out, what stays constant through shifts from modernism to postmodernism, from industrial to information

[10] As we will see in the next section the political ramifications of this are even more profound than indicated here.

societies, is the exploitation of capitalism. Furthermore, a point also made by Damasio, LeDoux and Goldberg in their discussions of pathology, constrictive processes become biologically sedimented; they endure. As Blackman et al. (2008) put it; 'the body is also a place where social influence gets stuck…' (p. 19). Finally, they acknowledge the body's 'relative spatio-temporal boundedness and inescapable mortal finitude' (p. 19). This is unavoidable but even the latter is not fixed. For example, Turner (2006) discusses the predicted ability of medical technologies to radically extend the life span. He points out how the individualist fantasies of hypermodernity are problematic in that they fail to consider the ecological and ethical consequences of such readings of aging as pathology.

Given this, we must also admit to the danger which exists when we allow for materiality as endurance; that of the possible re-insertion of the idea of an ahistorical resistance, a materiality that is natural and outside of the social, the re-establishment of a material/social binary. It seems to me that what is essential then is an understanding of materiality that does not stand outside of time and the social, just as there should not be a rendering of the social which excludes materiality and nature. Here Grosz (1994a) and Blackman's (2008) point is taken seriously; materiality is marked by openness, an unrelenting insistence towards alterity, a multitude of possible trajectories and formings. For Lakoff and Johnson (1999) the body is not an ahistorical mass for they admit to it being an evolving morphology. But it is here that the question should be asked: When the body is said to evolve, then it does so in what sense? This should not be a progressivist notion of a body shifting towards some ideal form for this reawakens the travesty of Social Darwinism (Blackman, 2008; Richards, 2002). Rather, less teleologically, it should allow the understanding that the body does not stand outside of history but emerges through it and is moulded by it. But this should not be a sense of time as natural, beyond the play of social-political influence. It needs to be understood as an evolution of which the socio-political is an inextricable component. Butler (1993, p. 5) mentions that 'nature has a history and not merely a social one' but this still admits to there being a social aspect to its history. There are not two histories, one social and one natural. This entwined reading of evolution allows us to regard the body as malleable, as dynamic and shifting, promising to always be different, as always in excess of culture's ideals and binaries, *but* still marked and formed

by sedimentations, resistances that are a product of history, laid down by an eternity within a social-material reality, by a co-constitutive evolution of the organism and environment. This allows for the body as fixed and sedimented but still marked by openness and the tendency to shift beyond the strictures of recent dominant ideologies, where the multiplicity of the past exceeds the limiting ambitions of the present. What emerges is not a natural and ahistorical body, but a body where a diversity of sedimentations emerging through time move at different paces and rates, creating the reality of constraint for (social) processes that hope to move more quickly. There is no natural outside of this social, only sedimentations that reveal the effects of the social-political-material movements of the past. The body is a social-material expression, but it is not a singular one, it simultaneously expresses a multitude of influences and episodes, some rooted more deeply than others, some moving less swiftly, providing restrictions to radicality whilst also providing an unthinkable set of possibilities and openings to the present that counter complete colonisation by the socio-political.

Against such a background an alternative understanding of Sampson's (1988) concern with the foundationalist fantasies present in Lakoff and Johnson's and Merleau-Ponty's work may be articulated. The body is no fixed ground nor is it endlessly malleable, rather it is, as also argued by LeDoux and Merleau-Ponty, a multiplicity of shifting sedimentations simultaneously providing constraints and alternatives. It emerges from a long history, the effect of a nexus of influences and relationships, characterised by variable constancies, flexible resistances and rigid plasticities. This does not contradict Butler's (1993) notion of continuous reiteration, resonated in the (mis)readings of Damasio and LeDoux, of a socio-political order which materialises a dichotomously sexed body, but points out that there are sedimentations that provide constancies, constraints and possibilities well beyond the ambitions of currently dominant discursive regimes. Finally, the mind as an emerging effect of the body can now be understood as so much more than the patterned play of neuronal activity. For if the body is itself an effect of relationships, a nexus of trajectories, thus being constituted by forces well beyond its skinny boundary, then the mind too, as of the body, flows from such influences and practices.

A universalism is constituted here in these claims about a (neural) body as open and malleable, sedimented and embedded. For some this may constitute a transgression, a forbidden spectre has been evoked rather than exorcised. So be it. No attempt is made in this project to transcend the other, only to negotiate the dynamics of the binary and to delineate the form and nature of the other's return. If a universalism is present then it is one of broad claims, of openings spread across the specificity of several (mis)readings that suggest the same abstractions (Cilliers, 1998). It is a universalism that counters dogmatic and wholesale exclusions of neurology and neurological writing and, since it is part of this category, of biology and biological writing. Nor should abstracting such universals be understood as aligning with the infinite possibilities of bourgeois postmodernism or the omnipotence of hypermodern science, for this would be a simplistic reading of what has been written across all these pages. Such an interpretation erases temporality and socio-political context, aspects which enable sedimentations and processes, oppressions and emancipations, and lie at the heart of understanding what has been 'said' here.

As stated in Chapter 1, various spectres have been identified by those invested in critical endeavours as being unquestionably problematic categories. They are regarded as having inevitable conservative effects, producing asocial and ahistorical individuals and entrenching capitalist, patriarchal, racist and other oppressive ideologies. The presence of any these spectres thus requires immediate exorcism, including the condemnation of whatever they are found embedded in. This is however a now automatic response that Grosz (1990) argues is actually not beyond question. Kirby (1991) shares this position arguing, as noted in Chapter 1, that essentialism provides 'the minimal consensual stuff' that enables political action (p. 93). Also, as Wilson (1998) has indicated, it is this fear of the closure that forecloses engagements with texts and subject matters that instead of confirming biologism, determinism, reductionism and individualism, show them as always in excess of such notions. The (mis)readings have illustrated this excess that troubles simplistic renderings of determinism and autonomous notions of self and positions reductionism as a necessary and impossible endeavour.

To synoptically re-state the above in terms of the neuroscience themes identified at the close of Chapter 2; the (mis)readings trouble classical essentialist, individualist, causal and reductionist economies: The essence or presence of form emerges from a necessary relationship with the excluded other. In this sense attempts to isolate an essence from context are always undermined since the excluded contaminates any such efforts at establishing a pure form. Similarly, attempts at articulating a centre, a point from which agency can proceed, are also undone by the other which decentres the centre by being the essential supplement for any such claims. The causal metaphysic must likewise proceed through the play of *différance* which undercuts linear causal routes or innate origins. Finally, reductionism too must proceed as a necessary strategy through which to engage with complexity, its ambitions always impossible as the aneconomic is always in excess of any economy.

SUSPICION AND UTOPIA: NEGOTIATING THE CRITICAL AGENDA

In critically evaluating a field, Prilleltensky and Fox (1997) ask whether it promotes social justice or whether it rather lends support for the status quo. Furthermore, does the field reflect on the social repercussions of its theories or does it try to assume a value-free position? In addition, what position does it hold with regard to the Good Life, the Good Society, power and professional ethics? Embodiment work, connectionism, and post-structuralism, the sites on which this project is located, have not escaped from such interrogations. The politics of post-structuralism has already been discussed in Chapter 4 so here the focus will be on critique of embodiment work and connectionism models.

The contemporary emphasis in body studies on fluidity and multiplicity resonates with the current global social order as described by Hardt and Negri (2000). They contrast the imperialism of modernity with the 'imperial' of Empire. The former is characterised by the nation-state, the centralisation of power, and the maintenance of fixed boundaries, whilst the latter is typified by decentralisation, flexible hierarchies and boundaries, hybrid and fragmented identities, and a distributed form of power which infiltrates all aspects of the public and private. Stating that imperialism is over, Hardt and Negri describe the material

re-figuration of industrial society through a metaphorics and technology of information networks, this constituting global flows of products, production, humanity, consumption, and (unidirectionally) wealth. This is similar to the dynamics articulated by Goldberg (2001) in his use of gradiential neural architecture as an analogy for the changes in the world order that he was observing at the turn of the millennium. For Hardt and Negri (2000) this is a shift from a disciplinary to a control society: In the former the body-subject is disciplined within the boundaries of various institutions, constituted through processes of normalisation structured by binary logics. In the latter, these control mechanisms exceed institutional boundaries and are distributed and ubiquitous, a biopolitics that 'regulates social life from its interior' as processes of subjectification become more nuanced and intensive, functioning especially on the level of affect (p. 23).

Rose (2007) notes a similar social change, tracing a shift from eugenic rationalities, associated with nationalism, to the biopolitics of liberal democracies which explicitly promote the 'freedom' and self-determination of the global citizen. The emphasis shifts from the population to the individual, from a concern with evolutionary fitness to the quality of life, from public to domesticated spaces, from the logics of mortality (death) to that of vitality (life), from a politics of population quality to risk management. At the same time we have, since the 1980s, the promotion of an 'ethics of enterprise, responsibility, and self-actualisation' (p. 109) and a contemporary body-subject who is 'free yet responsible, enterprising yet prudent' (p. 111) aiming at improving its own and its family's well-being. For Rose this is a move from the depth-ontology typical of 20th century psychology, characterised by concern with the nature of our psychological interiors, to a post-ontological view where the world is 'flattened' into surfaces, all aspects of being human becoming 'relays in complex, ramifying, and non-hierarchical networks, filiations, and connections' (p. 130). Associated with this are the direct mappings (intimate linkages) by neuroscience of cognition, emotion and desire onto the surfaces of the brain, constituting what Rose (2008) variably calls 'cerebral subjectivity', 'somatic individuality' or the 'neurochemical self' (p. 460). Given that '[m]ind is [then] simply what the brain does', Rose (2007, p. 192) wonders whether neurobiology will replace psychology in the twenty first century as the principle way of understanding our conduct. This means that

neuroscience becomes the new '"social"' science, the new dubious control technology[11]. The neurochemical self is not a passive or determined entity but a active agent who is required to take up new responsibilities and engage in new forms of self-surveillance and regulation in the light of new forms of biological interrogation and revelation. Moreover, Rose (2007) traces how the infiltration and excavation of the corporeal by the biological sciences, especially at the cellular, genetic and molecular levels, has resulted in the de-contextualisation, de-culturalisation and de-personalisation of the body reducing it to a 'utilitarian object' (p. 39). He quotes Andrews and Nelkin: 'Body parts are *extracted* like a mineral, *harvested* like a crop, or *mined* like a resource. Tissue is *procured*…' (p. 39, emphases in original). In this way the soma has been comprehensively claimed, in its dismemberment and dissolution, by capitalism. It thus becomes apparent that the opening, decentring and mobilising of the body not only enables an embedded and contingent reading but also, ironically, opens it up to exploitation in radically dehumanising ways never before imagined.

With regard to critical analysis, Hardt and Negri (2000, p. 138) indicate that the strategies, the 'old weapons', utilised in modernity to counter discriminatory and exploitative practices and rationales are no longer effective in the contemporary order which in fact thrives on and is constituted by such logics. The assault on metaphysics and its essentialist binaries 'in the name of difference', in this way undermining the hierarchical structures and distinct boundaries of modernity, constitute the politics of difference, fluidity and hybridity of Empire. This critical form has thus been assimilated into a new global exploitative matrix. Rose (2007) concurs; in a world in flux destabilising the present is no longer a radical move but a conservative act, a contribution to the maintenance of the status quo. In the light of the above, the (mis)readings and work of the neuroscientists presented in this report can be construed as radically conservative rather than a contribution to critical agendas!

[11] It also suggests that what we may be instituting through projects such as this one is a shift from a critical psychology to a critical neuroscience. The dominance of the brain-mind economy, of what Rose (2008) calls 'brainhood', in the twenty first century, the Cartesianism for the new millennium, would need a 'critical neuroscience' already inside disrupting its subtle, ubiquitous and convincing conservative agendas. It would also be a critical endeavour always already running the risk of pacifying institutionalisation and naïve antagonism.

When Papadopoulos (2004, p. 9) states that embodiment theories are 'active forces in the transformation of social and material conditions', we, as critical psychologists, can only nod in agreement; the aim of theory is not to describe the world but to change it. Where things become unsettled is when we realise that he links this ability to change to an anti-revolutionary agenda. Papadopoulos (2003, 2004) argues that contemporary celebrations of embodiment theory, connectionism models and 'post-structural' systems frameworks should be treated with suspicion as they can all be linked to the conservation of the current neo-liberal social order. In contrast to the 'discarnate body' of religion, he links several body topoi to traditional cognitivism; the 'cerebral body' which distances the physical body, the immune body concerned with preventing contamination, and the hereditary body, the diachronic corporeality of evolution. Emerging since the 1970s alongside these schemas is a distinctive 'self-creating body' partly constituted and given scientific legitimacy by the discourses of connectionism, embodiment theory and biotechnology. The opening and penetration of the body articulated by these discourses resonate with attempts, since the 1960s, of North-Atlantic emancipation movements to counter essentialist, determinist, impermeable, universalist, decontextualised and formulaic notions of the body. This has resulted in the celebratory discourses of hypermodernity and postmodernism which concede to liberal individualism by ignoring 'the facticity of the present' (Papadopoulos, 2004, p. 20) where military and social forms of technostructural violence normalise exclusion and create 'people who do not even figure' (2003, p. 74). For Papadopoulos (2004) then the emancipatory notion of the open body 'hinges on the belief in a self-reliant and self-assertive individual' which is neo-liberalism's chief ideology and technology in terms of subjectivity (p. 23). Here the assemblage through which the self emerges is that of the market where the individual then strives to reach a particular social position. He concludes that although embodiment is 'a radical challenge to western thought' it is also an element 'of the prevalent social and political governmentality in this particular historical moment' (p. 24).

It is hard to see from Papadopoulos' account how any critical agenda can be pursued since all attempts at reflexive action only proliferate the subjectivities on which liberal geoculture thrives. What is required is to consider the version of the 'self-creating body' being offered

here. If it is a self-creationism that recognises its constitutive embeddedness then it seems to be one that erases all aspects of this aside from that of the market which is inflated to a totality; all that then matters is one's place in this particular power grid. Such a limited reading of one's circumstance is then effective in maintaining particular ideologies, be it the independent male of patriarchy, the endlessly exploitable world of capitalism, or the autonomous individual of liberalism. Surely what is at stake here is the interpretation of identity as emergent; it is possible for the individual to simply use the other as competitive comparison without recognising any constitutive dependence whilst it is also possible to recognise one's emergence from context more radically thus revealing the illusion of autonomy, self-reliance and self-definition. The 'self-creating body' is a particular economic (ideological) imposition on the malleability articulated in embodiment studies. It is one that reintroduces a postmodern version of the liberal agent and erases context by placing responsibility with the individual to cope with 'changing climates', 'economic recessions' and 'stress'. It is a simultaneous attempt to close down and exploit openness through the asocial rationale of liberalism. Openness does not belong to an ideology no matter how ubiquitous the geoculture through which it is constituted. It is an opening for multiple political agendas. It brings home the point that nothing (including openness, stability, anti-essentialism, and essentialism) is inherently emancipatory or oppressive but, rather, in a world of multiple agendas such grounded (mis)readings offer resources to enact emancipations and oppressions through the imposition of various economies.

Hardt and Negri (2000) recognise this; for them a system that produces a profound multiplicity of singularities offers new routes for emancipatory action. Through their 'resistances, struggles, and desires', the multitude are able to independently construct a counter-Empire; alternative and innovative democratic forms of global flows and exchanges (p. xv). Where for Papadopoulos the 'self-creating body' of liberal geoculture is dangerously conservative, Hardt and Negri refer to the paradox of the plurality and multiplicity of biopower:

> while it unifies and envelops within itself every element of social life (thus losing its capacity to mediate social forces), [it] at that very moment reveals a new context,

> a new milieu of maximum plurality and uncontainable singularisation – a milieu of the event (p. 25).

Their view is thus positive: 'Empire creates a greater potential for revolution than did the modern regimes of power…' (p. 393).

For Rose (2007) it is a similar circumstance; recognising that the contemporary situation requires the revisiting of critical strategy. When all is in flux then we need to recognise and utilise continuities and stabilities as much as change. Change in itself is not emancipatory, stability is not essentially oppressive. Or, in the case of one posthuman nightmare where the body will be reduced to codes and commodities, we must recognise this as an economic imposition where the aneconomic of life will resist such attempted containments (Gane, 2006; Rose, 2007). Rose argues, as Hardt and Negri do, that critical analysis needs to move beyond the assault on traditional binaries for these do not function as radical interventions in a society of control. What he recommends is similar to the questions Prilleltensky and Fox (1997) and Painter et al. (2006) advocate: Irrespective of its origin (mainstream or critical) what does a figuration offer, what benefits and losses for whom, how can this rationale function as an agent of control or emancipation? For me it needs to be more than even this; it is not only a matter of needing, as Hardt and Negri call it, a post-binary logic, but a logic that is both post-binary and binary, where, on a contingent basis, from one matter to the next, we have to ask ourselves which is being or which can be utilised here? Rigid binaries can and do reassert themselves where, for example, a person is construed as simply the product of biology and where society can wash it hands of them, just as much as more subtle readings of our selves as both biological and social, both determined and agent, are possible.

Scientific practices still hide their politics (their morality) through claims of objectivity as they circumscribe bodies through oppressive notions of the normal and the complete. This continues to lead to legitimate concerns with unsettling such claims (often using science itself against these agendas), showing the finished as unfinished, the inert as vital, the static as in motion, the fixed as contingent, and the normal as instance (Diprose, 2002). The

(mis)readings of the texts in this project suggest that, aside from some metaphysical (binary and information processing discourse) remnants (where we feel encouraged to shake the inertness out of these readings) we are in the midst of a neurology in line with the logic of a postmodern politics, that of imperial sovereignty (Hardt & Negri, 2000). Thus these readings could be seen as wolves in sheep's clothing, radicality that simply serves the new version of old exploitative orders. But, as indicated above, what is important is that should this order now be different to that where binaries and disciplinary regimes held exclusive sway, then critical movements need to acknowledge this shift in the development of new forms of resistance.

However, extremely important is the recognition of the omnipresence of the metaphysical closure; in this celebration of the open against the closed, the plastic against the fixed, process against stasis, materiality against transcendence, the imposition of new binaries needs to be recognised and their 'presence' interrogated. The difficulty with readings sensitive to the fixings (the stasis) of the Law (the economic, secondary violence, metaphysics, order, information processing cognitive science, conventional connectionism) is that in bringing the other face to bear (the aneconomic, originary violence, *différance*, radical connectionism, and other quasi-synonymic nicknames) a simple inversion remains where 'philosophy' is replaced by 'literature'. Here we find again the fantasy of Rorty's reading of deconstruction as the free play of signification where the oppressive dualities of metaphysics have been overcome (Hurst, 2004). The trouble with this, as discussed in Chapter 4, is that it reveals a naiveté, a postmodern optimism, an instance of new age (bourgeois hippie) obscurantism, that slips wholesale into the post-history and post-political ideological ruse of the neo-liberal social order, blind to the dualism that is simultaneously reinserted in the very moment of its constitution. As Derrida pointed out; the metaphysical enclosure cannot be escaped but only exceeded.

Take as example the welcoming of postmodern Empire by Hardt and Negri (2000), the imperial realm of the post-binary, where the multitude, despite being subject to ubiquitous control are liberated from the transcendental impositions of modernity, and can now bring about a new social *order*. Postmodern such a society may be, freed from the imposition of

the economic it is not; the multitude still require an agenda (the constitution of a 'new proletariat' detailed in *Empire*) where the capitalist order's programme is to be overthrown. Hardt and Negri argue that '[h]ybridity itself is an empty gesture, and the mere refusal of order simply leaves us on the edge of nothingness – or worse, these gestures risk reinforcing imperial power rather than challenging it' (p. 217). Difference for the sake of difference suits the capitalist postmodern and assimilative machinery, which can then insert its economy on this love affair with the aneconomic. The need for direction, agenda, organisation, strategy, and order remains. The celebration of the aneconomic still requires the secondary violence of the economic.

Olivier's (2007) distinction between the postmodern and the post-structural remains significant, freeing critical conceptualisation from the pseudo-emancipatory relativism of the former and reminding us of the logic of contamination of the latter (Staten, 1984). It is here that Hepburn's (1999) point needs to be kept in mind, that if we have the insight and courage to recognise that the other always returns (in the very moment where we imagine ourselves liberated) then we should not mistake it for what it was but should articulate the displacement at hand. If the ostracised has returned, in what form has it made its comeback? Therefore, how does Damasio's singularity differ from Descartes' theatre? In what form does Goldberg's conductor remain after its fall from presence? How does LeDoux's brain differ once purged from its teleology; the myth of a yet to come utopia? Heraclitus was right; you cannot step into the same stream twice, but it is still a stream that you step into and it is still a step that you (have to) take.

REFLEXIVITY: VALIDITY, SCOPE, PROCESS

The reflexive section of a project attempts to enact the ideality of a meta-commentary, the assumption of an outside position where remarks can be made about a piece of work that distance the author from the text and assist in the constitution of validity by paradoxically demonstrating insight into its shortcomings. This is bound to fail. As a physical part of the text, a section of this chapter, it is an outside already on the inside. As a semantic piece its utility can only be demonstrated through its dependence on what it comments on. In fact,

its contamination is demanded and assumed since, as an end piece, it is hoped to retroactively work through what has been (the text) thus allaying certain concerns, transforming certain tensions, and bringing coherence where fragmentation threatens. It is an outside essential to the unity of the inside. In this particular 'outside' I will consider the themes of validity, neuro-centrism and process.

How should the (mis)readings (and the utilisation of deconstruction) presented in this report be viewed in relation to truth and legitimacy (validity)? It is impossible to provide an 'all totalising comprehension' of a text (or a 'method' such as deconstruction) but at the same time to forsake attempts at mastery is merely to concede to oppositional logic through a simple inversion (Gasché, 2000, p. 144). As indicated repeatedly, the relationship with the other is not in the form of the metaphysical operation of the binary opposition, but a displacement, something askew (Wilson, 1998). To do or bring justice to the text's heterogeneity (exuberance), to comprehensively tie all the strands together so as to provide a single reading, forcing the text into submission (domesticity), much like authors do in their statements of main points, is a hermeneutic fantasy (Gasché, 2000). The impossibility of this is that it adheres to the hope of transcending context, that which cannot be saturated and yet is essential for meaning (Culler, 1982). This, on a political level, is a good thing for should such a totalising economy (master narrative) be achievable then the very possibility of emancipation, of exceeding the order, would be erased and history would truly come to an end. Although necessity includes the point that being readable these texts demand engagement, it is more than this. As we have seen, to forsake engagement since mastery is unachievable is to deliver openness and malleability to the dictates of liberal geoculture and to surrender biology to the discourses of 'objective' science. Withdrawal is thus not an option. This necessary engagement forsakes the naïve truth of traditional science but this does not imply surrender to fiction, a relativism where anything goes. As a reading of scientific texts, evidential claims grounded in systematic procedures, the convolutions evoked are not without 'foundation' in the textures of the world. However, as *a* reading, an interpretation, the shroud of fiction is never discarded. Shimmering between fiction and non-fiction these readings, all such readings, reinscribe truth. Given this aporia we must proceed humbly, 'new threads must be twisted onto old ones', but with direction

(Staten, 1984, p. 3). What has emerged, what *continues* to emerge since context refuses to be drowned, is an ordering cut from the cloth of neuroscience waiting to be (or interminable already being) undone. The legitimacy of what has been provided rests with its ability to advance the critical agenda and although such potential is defended in the previous section this judgement remains deferred.

One of the origins of body studies is in the concern that corporeality had been erased thus becoming an 'absent present' in social science writing, locating culture 'from the neck up' (Blackman, 2008, p. 6). The positioning of the social outside the body has been mirrored in neuroscience by a materialism that attempts to address Cartesian dualism by locating it in the brain, confining subjectivity to the contents of the skull (Wilson, 2004). This neuroreductionism has been addressed at several points across this report; here I would like to comment on it in terms of methodology. Given that the focus in this project was on neuroscience texts it seems inevitable that a certain neuro-centrism would be reinscribed; the concern was with this aspect of our corporeality and not others and more specifically, given the preoccupation of the included authors, with the central nervous system. What we have here is a scope limited to the brain. This cannot but have the consequence of reinforcing in critical psychology a dominant proclivity found in mainstream psychology. In defence one could argue that every project needs a limited scope, a focus in order to be practical. Given the ambitiousness and emergent length of the project this now seems well justified; however the point remains that its scope still adheres to traditional compartmentalisations. It could also be claimed that this project needed to focus on such texts for the simple reason that they are so dominant in the mainstream and they therefore need to be tackled so as to avoid surrendering the field to conservative interpretation. It could also be argued that given an emphasis on the diacritical, an identity that emerges through the play of differences that necessarily exceeds the neural to include the wider contexts of body, environment and the socio-cultural, that the neuro-centrism evident across these pages is relentlessly troubled by a decentring logic, undermining any accusations of reductionism and traditionalism.

Finally, the notion of the 'report' is a myth in that it ascribes to the fantasy of the stage model. Once the work of review, analysis, synthesis, and so forth is done the report is written; it is the labour that follows the passion of work, a bureaucratic exercise where the cogito's conclusions and reality's revelations are laid bare; a repetition without difference. As a 'report' it is synchrony, unity, presence - here it all is now. Whilst as a 're-port' it is simultaneously a point of arrival and departure. The report only seems to be a snapshot, an atemporal moment, but the entwined processes of reading and writing unfold across time and thus in an ever changing context. It is therefore important to trouble the (silent) injunction to forget process and time that comes with this institutionalised tradition. This text was written (in a narrow sense) across a period of almost four years whilst its conceptualisation trails off into the past (and future). It is a dynamic process that did not adhere religiously to stages but, as with most such projects and like the brain, it was comprised of the folding of processes one into the other. Throughout this process there were learnings, forgettings, (re)engagements, revisions, false starts, euphoric flourishes, and endless (mis)readings of the three texts, the surrounding literature, and the 'method'. Each chapter reflects a myriad of contingencies visible as tones, slants, repetitions and errors. The tensions inherent are the result of more than negotiations with texts; the pages show the inscriptions of 'practical' (time to work, family responsibilities and support, collegial and personal wisdoms and idiocies, departmental politics, funding enablements, and so forth) and political circumstance; the writing for an audience - the (imagined) gaze of the academy and the economies (conventions, judgements, criteria) they embody.

Spivak (1974) makes the point that there is no 'book' as such, that it is 'always already a "text" constituted by the play of identity and difference' (p. xii). The text has no enduring identity, it has no stable beginning and no stable end: 'Each act of reading the "text" is a preface to the next', the 'inter-scribing of "reader (s)", "writer (s)", and language is forever at work' (p. xii). Thus there is no report as such (there never was), only an illusory ideality of stasis and presence that here, as in the brain, is enabled by convolutions forever on the move; a re-port.

REFERENCES

Barad, K. (2003). Posthumanist performativity: Toward an understanding of how matter comes to matter. *Signs: Journal of Women in Culture and Society, 28*(3), 801-831.

Bartky, S. L. (1988). Foucault, femininity, and the modernisation of patriarchal power. In L. Diamond & L. Quinby (Eds.), *Feminism and Foucault* (pp. 61-86). Boston: Northeastern University Press.

Bateson, P. (2000). Taking the stink out of instinct. In H. Rose & N. Rose (Eds.), *Alas, poor Darwin: Arguments against evolutionary psychology* (pp. 189-207). New York: Harmony Books.

Beardsworth, R. (1996). *Derrida and the political*. London: Routledge.

Bennett, M. R., & Hacker, P. M. S. (2003). *Philosophical foundations of neuroscience*. Oxford: Blackwell.

Bennington, G. (2000). Deconstruction and ethics. In N. Royle (Ed.), *Deconstructions: A user's guide* (pp. 64-82). New York: Palgrave.

Berger, P. L., & Luckmann, P. L. (1971). *The social construction of reality*. Harmondsworth: Penguin.

Blackburn, S. (1994). *Oxford dictionary of philosophy*. Oxford: Oxford University Press.

Blackman, L. (2008). *The body: The key concepts*. Oxford: Berg.

Blackman, L., Cromby, J., Hook, D., Papadopoulos, D., & Walkerdine, V. (2008). Creating subjectivities. *Subjectivity, 22*, 1-27.

Blondel, E. (1991). *Nietzsche: The body and culture*. Stanford, CA: Stanford University Press.

Brennan, T. (2004). *The transmission of affect*. New York: Cornell University Press.

Boothby, R. (2001). *Freud as philosopher: Metapsychology after Lacan*. London: Routledge.

Bordo, S. (1998). Bringing body to theory. In D. Welton (Ed.), *Body and flesh: A philosophical reader* (pp. 84-97). Oxford: Blackwell.

Bourdieu, P. (1993). *The field of cultural production*. Cambridge: Polity.

Bourdieu, P. (2004). Bodily Knowledge. In A. Blaikie, M. Hepworth, M. Holmes, A. Howson, D. Inglis, & S. Sartain (Eds.), *The Body: Critical concepts in sociology. Vol. 2. Sociology, nature and the body* (pp. 52-82). London: Routledge.

Burkitt, I. (2003). Psychology in the Field of Being: Merleau-Ponty, ontology and social constructionism. *Theory and Psychology, 13*(3), 319-338.

Burr, V. (1995). *An introduction to social constructionism*. London: Routledge

Butchart, A. (1997). Objects without origins: Foucault in South African socio-medical science. *South African Journal of Psychology, 27*(2), 101-110.

Butler, J. (1993). *Bodies that matter: On the discursive limits of "sex"*. New York: Routledge.

Butler, J. (1996). Bodies that matter. In A. Blaikie, M. Hepworth, M. Holmes, A. Howson, D. Inglis, & S. Sartain (Eds.), *The Body: Critical concepts in Sociology. Vol. 1. Knowing bodies* (pp. 139-168). London: Routledge.

Canfield, K. (1993). The microstructure of logocentrism: Sign models in Derrida and Smolensky. *Postmodern Culture 3*(3), 1-39.

Carpenter, A. N. (n.d.). *Kant, the body and knowledge*. Retrieved 20 October, 2006, from http://www.bu.edu/wcp/Papers/TKno/TKnoCarp.htm

Center for Neural Science. (n.d.). *Joseph E. LeDoux: Memory and emotion*. Retrieved 3 April, 2009, from http://www.cns.nyu.edu/corefaculty/LeDoux.php

Churchland, P. S. (1989). *A neurocomputational perspective: The nature of mind and the structure of science*. Cambridge, MA: MIT Press.

Ciavatta, D. (2005). Hegel on owning one's own body. *The Southern Journal of Philosophy, XLIII*, 1-23.

Cilliers, F. P. (1989). *Brain, language and consciousness: A post-structural neuropsychology*. Unpublished Master's dissertation, University of Stellenbosch, Stellenbosch.

Cilliers, P. (1990). The brain, the mental apparatus and the text: A post-structural neuropsychology. *South African Journal of Philosophy, 9*(1), 1-8.

Cilliers, P. (1998). *Complexity and postmodernism: Understanding complex systems*. London: Routledge.

Cisek, P. (2001). Embodiment is all in the head. *Behavioral and Brain Sciences, 24*(1), 36-38.

Clark, A. (1999). An embodied cognitive science? *Trends in Cognitive Sciences, 3*(9), 345-351.

Clark, T. (2000). Deconstruction and technology. In N. Royle (Ed.), *Deconstructions: A user's guide* (pp. 238-257). New York: Palgrave.

Connolly, W. E. (2002). *Neuropolitics: Thinking, culture, speed*. Minneapolis: University of Minnesota Press.

Critchley, S., & Mooney, T. (1994). Deconstruction and Derrida. In R. Kearney (Ed.), *Continental philosophy in the 20th century* (pp. 441-473). London: Routledge.

Cromby, J. (n.d.). *The critical psychology of embodiment*. Unpublished manuscript, University of Loughborough, Loughborough.

Cromby, J. (2004). Between constructionism and neuroscience: The societal co-constitution of embodied subjectivity. *Theory and Psychology, 14*(6), 797-821.

Cromby, J. (2006). *Embodying psychology through neuroscience: Conceptual and political issues*. Paper presented at the International Society for Political Psychology Conference, Barcelona, Spain.

Cromby, J. (2007). Integrating social science with neuroscience: Potentials and problems. *BioSocieties, 2*, 149-169.

Cromby, J., & Nightingale, D (1999). What's wrong with social constructionism? In D. Nightingale & J. Cromby, *Social constructionist psychology: A critical analysis of theory and practice* (pp. 1-19). Buckingham: Open University Press.

Cromby, J., & Standen, P. (1999). Taking our selves seriously. In D. Nightingale & J. Cromby, *Social constructionist psychology: A critical analysis of theory and practice* (pp. 141-156). Buckingham: Open University Press.

Crossley, N. (1993). The politics of the gaze: Between Foucault and Merleau-Ponty. *Human Studies, 16*, 399-419.

Crossley, N. (1996). Body-Subject/Body-Power: Agency, inscription and control in Foucault and Merleau-Ponty. In A. Blaikie, M. Hepworth, M. Holmes, A. Howson, D. Inglis, & S. Sartain (Eds.), *The Body: Critical concepts in Sociology. Vol. 1. Knowing bodies* (pp. 219-236). London: Routledge.

Crossley, N. (2001). *The social body: Habit, identity and desire*. London: Sage.

Cullen, B. (1994). Philosophy of existence 3: Merleau-Ponty. In R. Kearney (Ed.), *Continental philosophy in the 20th century* (pp.105-130). London: Routledge.

Culler, J. (1982). *On deconstruction: Theory and criticism after structuralism*. Ithaca, New York: Cornell University Press.

Dafermos, M., & Marvakis, A. (2006). Critiques in Psychology – Critical psychology. *Annual Review of Critical Psychology, 5*, 1-20.

Damasio, A. (1994). *Descartes' error: Emotion, reason and the human brain*. New York: Quill.

Damasio, A. (1999). *The feeling of what happens: Body, emotion and the making of consciousness*. London: Vintage.

Damasio, A. (2003). *Looking for Spinoza: Joy, sorrow and the feeling brain*. Orlando, Florida: Harcourt.

Danziger, K. (1997). *Naming the mind: How psychology found its language*. London: Sage.

Dautenhahn, K., Ogden, B., & Quick, T. (2002). From embodied to socially embedded agents – Implications for interaction aware robots. *Cognitive Science Research, 3*, 397-428.

de Spinoza, B. (2000). From Ethics. In D. M. Rosenthal (Ed.), *Materialism and the mind-body problem* (pp. 31-42). Cambridge: Hackett.

Derrida, J. (1982). *Différance.* In *Margins of philosophy* (pp. 1-27). London: Prentice Hall.

Derrida, J. (1986). Signature event context. In *Margins of philosophy* (pp. 307-330). Brighton, Sussex: Harvester Press.

Derrida, J. (2001). Freud and the scene of writing. In *Writing and difference* (pp. 246-291). London: Routledge.

Derrida, J. (2004). *Positions*. London: Continuum.

Diprose, R. (2002). Writing in blood: Response to Helen Keane and Marsha Rosengraten, 'On the biology of sexed subjects'. *Australian Feminist Studies, 17*(39), 279-282.

Dreyfus, H. L. (1996). *The current relevance of Merleau-Ponty's phenomenology of embodiment*. Retrieved 22 August, 2000, from http://www.phil.indiana.edu/ejap /1996.spring/ dreyfus.1996.spring.html

Dreyfus, H. L., & Rabinow, P. (1983). *Michel Foucault: Beyond structuralism and hermeneutics* (2nd ed.). Chicago: University of Chicago Press.

Durrheim, K. (1997). Social constructionism, discourse and psychology. *South African Journal of Psychology, 27*(3), 175-182.

Eagleton, T. (1981). Marxism and deconstruction. *Contemporary Literature, 22*(4), 477-488.

Fink, B. (1995). *The Lacanian subject: Between language and jouissance*. Princeton: Princeton University Press.

Flynn, B. C. (1984). Textuality and the flesh: Derrida and Merleau-Ponty. *Journal of the British Society of Phenomenology, 15*(2), 164-179.

Foster, D. (2008). Critical Psychology: A historical overview. In C. van Ommen & D. Painter (Eds.), *Interiors: A history of Psychology in South Africa* (pp. 92-124). Lansdowne: UNISA Press.

Foucault, M. (1976). *The history of sexuality (Vol. 1)*. New York: Pantheon.

Foucault, M. (1979). *Discipline and punish: The birth of the prison*. Harmondsworth: Penguin.

Foucault, M. (1980). Body/Power. In C. Gordon (Ed.), *Power/knowledge: Selected interviews and other writings (1972-1977)* (pp. 55-62). New York: Pantheon Books.

Foucault, M. (1994). Nietzsche, Genealogy, History. In J. D. Faubion (Ed.), *Essential works of Foucault 1954-1984. Vol. 2. Aesthetics, method and epistemology* (pp. 369-291). London: Penguin.

Frank, A. W. (1990). Bringing bodies back in: A decade review. *Theory, Culture and Society, 7*, 131-162.

French-English dictionary (1999). New Lenark, Scotland: Geddes & Grosset.

Gane, N. (2006). Posthuman. *Theory, Culture and Society, 23*(2-63), 431-434.

Gasché, R. (2000). Deconstruction and hermeneutics. In N. Royle, *Deconstruction: A user's guide* (pp. 137-150). Basingstoke, Hampshire: Macmillan

Gatens, M. (1991). A critique of the sex/gender distinction. In S. Gunew (Ed.), *A reader in feminist knowledge* (pp. 139-157). London: Routledge.

Gatens, M. (1996). Towards a feminist philosophy of the body. In A. Blaikie, M. Hepworth, M. Holmes, A. Howson, D. Inglis, & S. Sartain (Eds.), *The Body: Critical concepts in Sociology. Vol. 1. Knowing bodies* (pp. 169-179). London: Routledge.

Gergen, K. J. (1985). The social constructionist movement in modern psychology. *American Psychologist, 40*(3), 266-275.

Globus, G. G. (1992). Derrida and connectionism: *Différance* in neural nets. *Philosophical Psychology, 5*(2), 183-197.

Globus, G. G. (1995). *The postmodern brain*. Amsterdam: John Benjamins.

Goldberg, E. (n.d.). *Short vitae*. Retrieved January 7, 2009, from http://www.fielding.edu/psy/psy_faculty/e_goldberg.asp

Goldberg, E. (1989). Gradiental approach to neocortical functional organisation. *The Journal of Clinical and Experimental Neuropsychology, 11*(4), 489-517.

Goldberg, E. (1990). Higher cortical functions in humans: The gradiental approach. In E. Goldberg (Ed.), *Contemporary neuropsychology and the legacy of Luria* (pp. 229-276). Hillsdale, N.J.: Lawrence Erlbaum.

Goldberg, E. (2001). *The executive brain: Frontal lobes and the civilised mind*. New York: Oxford University Press.

Gordon, W. T., & Lubell, A. (1996). *Saussure for beginners*. New York: Writers & Readers Publishing.

Grosz, E. (1990). A note on essentialism and difference. In S. Gunew (Ed.), *Feminist knowledge: Critique and construct* (pp. 332-344). London: Routledge.

Grosz, E. (1994a). Experimental desire: Rethinking queer subjectivity. In J. Copjec (Ed.), *Supposing the subject* (pp. 133-157). London: Verso.

Grosz, E. (1994b). *Volatile bodies: Toward a corporeal feminism*. Bloomington: Indiana University Press.

Grosz, E. (1996). Notes towards a corporeal feminism. In A. Blaikie, M. Hepworth, M. Holmes, A. Howson, D. Inglis, & S. Sartain (Eds.), *The Body: Critical concepts in Sociology. Vol. 1. Knowing bodies* (pp. 180-192). London: Routledge.

Haraway, D. (1991). *Simians, cyborgs and women: The reinvention of nature*. New York: Routledge.

Hardt, M., & Negri, A. (2000). *Empire*. London: Harvard University Press.

Harré, R. (1998). Man and woman. In D. Welton (Ed.), *Body and flesh: A philosophical reader* (pp. 11-25). Oxford: Blackwell.

Harré, R. (2002). *Cognitive science: A philosophical introduction*. London: Sage.

Harvey, D. (2000). *Spaces of hope*. Edinburgh: Edinburgh University Press.

Heather, N. (1976). *Radical perspectives in psychology*. London: Methuen.

Hekman, S. (1998). Material bodies. In D. Welton (Ed.), *Body and flesh: A philosophical reader* (pp. 61-70). Oxford: Blackwell.

Hepburn, A. (1999). Derrida and Psychology: Deconstruction and its ab/uses in critical and discursive psychologies. *Theory and Psychology, 9*(5), 639-665.

Hook, D. (2004). Critical psychology: The basic co-ordinates. In D. Hook (Ed.), *Critical psychology* (pp. 10-23). Cape Town: UCT Press.

Hook, D., & Parker, I. (2002). Deconstruction, psychopathology and dialectics. *South African Journal of Psychology, 32*(2), 49-54.

Hughes, A., & Witz, A. (1996). Feminism and the matter of bodies. In A. Blaikie, M. Hepworth, M. Holmes, A. Howson, D. Inglis, & S. Sartain (Eds.), *The Body: Critical concepts in Sociology. Vol. 1. Knowing bodies* (pp. 193-206). London: Routledge.

Hund, J. (1998). Hegel's break from Kant: The leap from individual psychology to sociology. *Philosophy of the Social Sciences, 28*(2), 226-243.

Hurst, A. (2004). Derrida's quasi-transcendental thinking. *South African Journal of Philosophy, 23*(3), 244-266.

Irigaray, L. (1996). This sex which is not one. In A. Blaikie, M. Hepworth, M. Holmes, A. Howson, D. Inglis, & S. Sartain (Eds.), *The Body: Critical concepts in Sociology. Vol. 1. Knowing bodies* (pp. 131-138). London: Routledge.

Ivey, G. (1986). Elements of a critical psychology. *Psychology in Society, 5*, 4-27.

Jary, D., & Jary, J. (2000). *Harper's internet-linked dictionary of Sociology*. Glasgow: Collins.

Johnson, B. (1981). Translator's introduction. In J. Derrida, *Dissemination* (pp. vii-xxxiii). London: The Athlone Press.

Kamuf, P. (2000). Deconstruction and love. In N. Royle (Ed.), *Deconstructions: A user's guide* (pp. 151-170). London: Palgrave.

Kandel, E. R., Schwartz, J. H., & Jessell, T. M. (2000). *Principles of neural science* (4th ed.). New York: McGraw-Hill.

Keane, H., & Rosengarten, M. (2002). On the biology of sexed subjects. *Australian Feminist Studies, 17*(39), 261-277.

Kemerling, G. (2006). *Immanuel Kant*. Retrieved October 20, 2006, from http://www.philosophypages.com/ph/kant.htm

Kirby, V. (1991). Corpus delicti: The body as the scene of writing. In R. Diprose & R. Ferrell (Eds.), *Cartographies: Poststructuralism and the mapping of bodies and spaces* (pp. 88-100). Sydney: Allen & Unwin.

Kirby, V. (1993). 'Feminisms, reading, postmodernisms': Rethinking complicity. In S. Gunew & A. Yeatman (Eds.), *Feminism and the politics of difference* (pp. 20-34). Sydney: Allen & Unwin.

Kirby, V. (1997). *Telling flesh: The substance of the corporeal.* New York: Routledge.

Kolb, B., & Whishaw, I. Q. (1996). *The fundamentals of human neuropsychology* (4th ed). New York: W.H. Freeman & Company.

Lacan, J. (2002). *Ecrits: A selection*. New York: W. W. Norton and Co.

Lakoff, G. (1988). Smolensky, semantics, and the sensorimotor system. *Behavioral and Brain Sciences, 11*, 1-74.

Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to Western thought.* New York: Basic Books.

Lane, J. F. (2000). *Pierre Bourdieu: A critical introduction*. London: Pluto Press

LeDoux Lab. (n.d.). *LeDoux Biography*. Retrieved April 2, 2009, from http://www.cns.nyu.edu/ledoux/ledoux_bio.htm

LeDoux, J. (1996). *The Emotional Brain: The Mysterious Underpinnings of Emotional Life*. New York: Simon & Shuster.

LeDoux, J. (2002). *Synaptic self: How our brains become who we are*. New York: Penguin Books.

Levin, M. (1960). Consciousness and the highest cerebral centres, with remarks on the Penfield-Walshe controversy. *Journal of Mental Science, 106*, 1398-1404.

Lewis, M. D. (2002). The dialogical brain: Contributions of emotional neurobiology to understanding the dialogical self. *Theory and Psychology, 12*(2), 175-190.

Lezak, M. D., Howieson, D. B., & Loring, D. W. (2004). *Neuropsychological assessment* (4th ed.). New York: Oxford University Press.

Lourenço, O. (2001). The danger of words: A Wittgensteinian lesson for developmentalists. *New Ideas in Psychology, 19*, 89-115.

Louw, J. (2002). Psychology, history and society. *South African Journal of Psychology, 32*(1), 1-8.

Machado, A., Lourenço, O., & Silva, F. J. (2000). Facts, concepts, and theories: The shape of psychology's epistemic triangle. *Behavior and Philosophy, 28*, 1-40.

Macleod, C. (2002). Deconstructive discourse analysis: Extending the methodological conversation. *South African Journal of Psychology, 32*(1), 17-25.

Mahar, C., Harker, R., & Wilkes, C. (1990). The basic theoretical position. In R. Harker, C. Mahar, & C. Wilkes (Eds.), *An introduction to the work of Pierre Bourdieu* (pp. 1-25). London: Macmillan.

Marcus, G. E., & Saka, E. (2006). Assemblage. *Theory, Culture, and Society, 23*(2-3), 101-109.

Marcuse, H. (1999). *Reason and revolution: Hegel and the rise of social theory*. New York: Humanity Books. (Original work published 1941).

Mareschal, D. (2001). Can there be embodiment without a body/brain. *Behavioral and Brain Sciences, 24*(1), 49-50.

Mather, R. (2000). The foundations of critical psychology. *History of the Human Sciences, 13*(2), 85-100.

Matthews, E. H. (2004). Merleau-Ponty's body-subject and psychiatry. *International Review of Psychiatry, 16*(3), 190-198.

Merleau-Ponty, M. (1996). The synthesis of one's own body. In A. Blaikie, M. Hepworth, M. Holmes, A. Howson, D. Inglis, & S. Sartain (Eds.), *The Body: Critical concepts in Sociology. Vol. 1. Knowing bodies* (pp. 56-61). London: Routledge.

Morgan, M. (2005). Remembering embodied domination: Questions of critical/feminist psy-discourse on the body. *Theory and Psychology, 15*(3), 357-372.

Munakata, Y., Sahni, S. D., & Yerys, B. E. (2001). An embodied theory in search of a body: Challenges for a dynamic systems model of infant perseveration. *Behavioral and Brain Sciences, 24*(1), 56-57.

Nationmaster Encyclopedia (n.d.) *Elkhonon Goldberg*. Retrieved January 7, 2009, from http://www.nationmaster.com/encyclopedia/Elkhonon-Goldberg

Nell, V. (2000). *Cross-cultural neuropsychological assessment: Theory and practice*. Mahwah, N.J.: Erlbaum.

Nightingale, D. J., & Cromby, J. (1999). Reconstructing social constructionism. In D. Nightingale & J. Cromby, *Social constructionist psychology: A critical analysis of theory and practice* (pp. 207-224). Buckingham: Open University Press.

Nightingale, D. J., & Cromby, J. (2002). Social constructionism as ontology: Exposition and example. *Theory and Psychology, 12*(5), 701-713.

Norris, C. (1982). *Deconstruction: Theory and practice*. London: Methuen.

Norris, C. (2004) Introduction. In J. Derrida, *Positions* (pp. ix-xliii). London: Continuum.

No Subject (n.d.) *Beautiful soul*. Retrieved June 5, 2009, from http://nosubject.com/Beautiful_Soul

Olivier, B. (2007). Postmodernity, globalisation, communication and identity. *Communicare: Journal for Communication Sciences in Southern Africa*, 26(2), 36-55.

Osbeck, L. M. (2005). Method and theoretical psychology. *Theory and Psychology, 15*(1), 5-26.

Ostrander, G. (1996). Foucault's disappearing body. In A. Blaikie, M. Hepworth, M. Holmes, A. Howson, D. Inglis, & S. Sartain (Eds.), *The Body: Critical concepts in Sociology. Vol. 1. Knowing bodies* (pp. 256-268). London: Routledge.

Papadopoulos, D. (2003). The ordinary superstition of subjectivity: Liberalism and technostructural violence. *Theory and Psychology, 13*(1), 73-93.

Papadopoulos, D. (2004). *North-Atlantic self-creationism. On the perils and promises of embodiment and connectionism*. Unpublished chapter, Free University of Berlin, Berlin.

Painter, D., Terre Blanche, M., & Henderson, J. (2006). Critical psychology in South Africa: Histories, themes and prospects. *Annual Review of Critical Psychology, 5*, 212-235.

Panksepp, J. (1998). *Affective neuroscience: The foundations of human and animal emotions*. New York: Oxford University Press.

Pizanias, C. (1998). Habitus: From the inside out and the outside in. In H. J. Stam (Ed.), *The body and psychology* (pp. 141-159). London: Sage.

Porter, C. (2003). *Flesh in the age of reason: How the enlightenment transformed the way we see our bodies and souls*. London: Penguin.

Prilleltensky, I., & Fox, D. (1997). Introducing critical psychology: Values, assumptions, and the status quo. In D. Fox & I. Prilleltensky (Eds.), *Critical psychology: An Introduction* (pp. 3-21). London: Sage.

Radley, A. (1995). The elusory body and social constructionist theory. *Body and Society, 1*(2), 3-23.

Richards, G. (2002). *Putting psychology in its place: A critical historical introduction*. Hove: Psychology.

Riegler, A. (2002). When is a cognitive system embodied? *Cognitive Systems Research, 3*, 339-348.

Roberts, P. D. (2001). Cooperative field theory is critical for embodiment. *Behavioral and Brain Sciences, 24*(1), 59-60.

Rose, N. (2007). *The politics of life itself: Biomedicine, power, and subjectivity in the twenty-first century*. New Jersey: Princeton University Press.

Rose, N. (2008). Psychology as a social science. *Subjectivity, 25*, 446-462.

Rosenthal, D. M. (Ed.) (2000). *Materialism and the mind-body problem* (2nd ed.). Cambridge: Hackett.

Royle, N. (2000). What is deconstruction? In N. Royle (Ed.), *Deconstructions: A user's guide* (pp. 1-13). New York: Palgrave.

Russon, J. (1993). Reading and the body in Hegel. *CLIO, 22*(4). Retrieved 23 October, 2006, from http://www.questia.com/PM.qst?a=o&d=5000203913

Sampson, E. E. (1998). Establishing embodiment in Psychology. In H. J. Stam (Ed.), *The body and psychology* (pp. 30-52). London: Sage.

Saul, N. (1999). Introduction: From 'Ideedichtung to the *commercium mentis et corporis*: The body in German literature around 1800. *German Life and Letters, 52*(2), 115-122.

Scheurich, J. J., & McKenzie, K. B. (2000). Foucault's methodologies: Archaeology and genealogy. In N. K. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative methods* (pp. 841-868). London: Sage.

Schouten, M. (2007). The flesh and bones of cognition: Against Cartesian Psychology. In V. van Deventer, M. Terre Blanche, E. Fourie, & P. Segalo (Eds.), *Citizen City: Between constructing agent and* constructed *agency* (pp. 220-231). West Concord: Captus University Publications.

Schyfter, P. (2007). Review: The sexual politics of neurons. *Metascience, 16*, 349-353.

Scott, C. L., & Stam, H. J. (1996). Habit and *habitus*: Historical and social conceptions. In C. W. Tolman, F. Cherry, R. van Hezewijk, & I. Lubek (Eds.), *Problems of theoretical psychology* (pp. 359-367). Canada: Captus University Publications.

Slaughter, C. (1985). *Marx and Marxism: An Introduction*. New York: Longman.

Smolensky, P. (1988). On the proper treatment of connectionism. *Behavioral and Brain Sciences, 11,* 1-74.

Soler, C. (1995). The body in the teaching of Jacques Lacan. *Journal of the Centre of Freudian Analysis and Research, 6,* 6-38.

Solms, M., & Saling, M. (1990). *A moment of transition: Two neuroscientific articles by Sigmund Freud.* London: Karnac Books.

Solms, M., & Turnbull, O. (2002). *The brain and the inner world: An introduction to the neuroscience of subjective experience*. New York: Other Press.

Spencer, J. P. (2001). The essence of cognitive development. *Behavioral and Brain Sciences, 24*(1), 62-63.

Spencer, L., & Krauze, A. (1996). *Introducing Hegel*. Cambridge: Icon Books.

Spivak, G. C. (1974). Translator's preface. In J. Derrida, *Of grammatology* (pp. iv-lxxxvii). Baltimore: John Hopkins University Press.

Spurling, L. (1977). *Phenomenology and the social world: The philosophy of Merleau-Ponty and its relation to the social sciences*. London: Routledge & Kegan Paul.

Stam, H. J. (1998). The body's psychology and psychology's body. In H. J. Stam (Ed.), *The body and psychology* (pp. 1-12). London: Sage.

Stanford Encyclopaedia of Philosophy (2007). *Distributive justice.* Retrieved 8 June, 2009, from http://plato.stanford.edu/entries/justice-distributive/

Staten, H. (1984). *Wittgenstein and Derrida*. Oxford: Basil Blackwell.

Stenner, P. H. D. (2004). Psychology and the political: On the psychology of natural rights and the political origins of modern psychology. *International Journal of Critical Psychology, 12,* 14-37.

Sulloway, F. J. (1979). *Freud, biologist of the mind: Beyond the psychoanalytic legend*. London: Burnett Books.

Sykes, J. B. (1978). *The pocket Oxford dictionary of current English* (6th ed.). Oxford: Oxford University.

Thelen, E., Schöner, G., Scheier C., & Smith, L. B. (2001). The dynamics of embodiment: A field theory of infant perseverative reaching. *Behavioral and Brain Sciences, 24*(1), 1-34, 70-86.

Todes, S. (1996). The classic view of the way the human subject has his body, and Descartes' rejection of it. In A. Blaikie, M. Hepworth, M. Holmes, A. Howson, D. Inglis, & S. Sartain (Eds.), *The Body: Critical concepts in Sociology. Vol. 1. Knowing bodies* (pp. 25-36). London: Routledge.

Turner, T. (1994). Bodies and anti-bodies: Flesh and fetish in contemporary society. In T. J. Csordas (Ed.), *Embodiment and experience: The existential ground of culture and self* (pp. 27-47). Cambridge: Cambridge University Press.

Turner, B. (2006). Body. *Theory, Culture and Society, 23*(2-63), 223-229.

Valenti, S. S., & Stoffregen, T. A. (2001). The social dynamics of embodied cognition. *Behavioral and Brain Sciences, 24*(1), 67-68.

van de Laar, T., & de Regt, H. (2008). Is cognitive science changing its mind? *Theory and Psychology,18*(3), 291-296.

van der Merwe, W. L., & Voestermans, P. P. (1995). Wittgenstein's legacy and the challenge to Psychology. *Theory and Psychology, 5(1), 27-48.*

van Hezewijk, R. (1999). Digging tunnels: Will philosophy, psychology and biology ever meet? In W. Maier, B. Bayer, B. D. Esgalhado, R. Jorna, & E. Schraube (Eds.), *Challenges to theoretical psychology* (pp. 157-164). Toronto: Captus Press.

Want, C., & Klimowski, A. (1996). *Introducing Kant*. Cambridge: Icon.

Watson, S. (1998). The neurobiology of sorcery: Deleuze and Guattari's brain. *Body and Society, 4*(4), 23-45.

Welton, D. (1998). Introduction: Situating the body. In D. Welton (Ed.), *Body and flesh: A philosophical reader* (pp. 1-8). Oxford: Blackwell.

Wetherell, M. (1999). Beyond binaries. *Theory and Psychology, 9*(3), 399-406.

Whitman, W. (1986). *Song of myself*. London: Penguin Books.

Wilden, A. (1980). *System and structure: Essays in communication and exchange* (2nd ed.). London: Tavistock.

Wilkinson, S. (1997). Feminist Psychology. In D. Fox & I. Prilleltensky (Eds.), *Critical psychology: An introduction* (pp. 247-264). London: Sage.

Wilson, E. A. (1998). *Neural geographies: Feminism and the microstructure of cognition*. New York: Routledge.

Wilson, E. A. (2004). *Psychosomatic: Feminism and the neurological body*. London: Duke University Press.

Yanchar, S. C., Gantt, E. E., & Clay, S. L. (2005). On the nature of a critical methodology. *Theory and Psychology, 15*(1), 27-50.

Yen, J. (2008). A history of community psychology in South Africa. In C. van Ommen & D. Painter (Eds.), *Interiors: A history of Psychology in South Africa* (pp. 385-412). Pretoria: UNISA Press.

Young, I. M. (1980). Throwing like a girl: A phenomenology of feminine body comportment, motility and spatiality. *Human Studies, 3*, 137-156.

Younkins, E. (1998). Philosophical enemies of a free society. *The Social Critic*. Retrieved 26 October, 2006, from http://www.quebecoislibre.org/younkins3.html

Žižek, S. (2000). *The ticklish subject: The absent centre of political ontology*. London: Verso.

Žižek, S. (2006). *The parallax view*. Cambridge: Massachusetts Institute of Technology.