

Notions of Subject, Technology and Self

Bodies and Stories, Chapter 1, Draft

“[T]echnological machines of information and communication operate at the heart of human subjectivity, not only within its memory and intelligence, but within its sensibility, affects and unconscious fantasies.” (Guattari 1992: 4)

The self “plays a singularly important role in the ongoing cognitive economy of that living body, because, of all the things in the environment an active body must make mental models of, none is more crucial than the model the agent has of itself.” (Dennett 1991: 426-427)

The self is a multiple and heterogenous cognitive model at the core of individual subjectivity, facilitating interaction with a complex environment. Recent developments in technologies that mediate our experience may have fundamental yet unanticipated effects on the processes by which the self is produced.

As a multifaceted and dynamic construct, the self plays a key role in our phenomenological experience of being. It also contributes to our operational capabilities – social, mental, and physical. The implications of engaging with mediating technologies depend on both the nature of the technologies in question, and the mechanisms responsible for the production of the self. This project aims to present a model of the self, and to explore the potential repercussions of these technological engagements.

An appreciation of the ways that emergent technologies engage with the self assists in a broader understanding of how these technologies articulate with the individual subjectivity of which the self is a part. Writing on the implications of technological change, Felix Guattari suggests that the new and complex forms of ‘machinic subjectivation’ resulting from the articulation of technology and individuals have the potential either to create unprecedented freedom, or to further mechanical oppression (Guattari 1992: 5). Through an understanding of the mechanisms by which the self – as part of our individual subjectivity – articulates with mediating technologies, strategies may be developed for positive and affirming engagements. By accepting the heterogenous, multiple and dynamic nature of the self, the ‘machinic assemblages’ individuals create by engaging with technology can strive to facilitate rather than collapse openings onto new universes of opportunity. It is toward this goal that the present project aspires.

In the following chapter, a model of the self will be presented, synthesised from cognitive, psychoanalytic and neurological analyses of human behaviour (Stern 1985; ; Varela 1991; ; Clark 1997; ; Damasio 2000). Apropos to this, the present chapter will situate the project within a number of academic discourses. It will also critique prominent arguments made with respect to the intersection of self and technology. Initially, a brief overview of theoretical approaches to subjectivity will be presented to define a broad domain for analysis. Following this, a review will be conducted of approaches that have been used to study the engagement of subjectivity with forms of technology. This review will particularly focus on recent mediating technologies and



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

the resulting discussion of posthumanism and cyborgs. Finally, the chapter will conclude by narrowing focus from subjectivity to the self. This presentation of the self as a constrained aspect of subjectivity will provide a starting point for the development of a model of the self carried out in the following chapter.



SUBJECT

The nature of human subjectivity has been a focus of study in many disparate disciplines for over two thousand years. This is wholly unsurprising given that subjectivity, as it is generally understood, forms the lens through which individuals experience reality.

The introspective nature of much of this study, combined with the diversity of disciplines and theorists involved, has resulted in considerable lack of clarity where terminology is concerned. Terms such as 'subject', 'subjectivity', 'self', 'person', 'ego' and 'identity' are used alternately – and even interchangeably – to denote the elusive and often poorly defined human subject.

For the purposes of this thesis, the term 'subject' will be used to denote the broad construct of subjectivity – particularly as the more limiting 'self' "does not capture the sense of social and cultural entanglement that is implicit in the word 'subject'" (Mansfield 2000: 2). The subject is a culturally enmeshed term, always opposed to some form of Other and hence linked to society, ideas or other subjects (Mansfield 2000: 3). The term 'self' will be reserved, where possible, to refer to aspects of the subject that are reflexive representations of the individual – as discussed toward the end of this chapter.

Additionally, the term 'individual' will be used to denote a single organism (often human) consisting of body, brain, and the operations thereof. Maturana and Varela provide a useful operationalisation of the term in their pioneering writing on the nature of living systems (Maturana 1980). As a foundation, they recast the term 'machine' to describe any set of related components, emphasising the importance of the relations rather than the nature of constituent components (Maturana 1980: 77). They then define an individual as a machine whose organisational structure is constrained in two ways. Firstly, the relations in which components of the individual are implicated must be internal to the individual, ensuring operational autonomy. Secondly, the relations that make up the individual must be organised in such a way that their operation ensures that they remain invariant. As a result of this, the relations strive to produce homogenous future relations – a process described as 'homeostasis'. (Maturana 1980: 80-81)

As a result of this homeostatic production, the machine maintains an ongoing identity that forms the core of its individuality. This cannot be said of machines that are interrelated with, and hence dependent on, other machines. Nor can it be said of machines that fail to generate any form of coherent identity through their operation. For Maturana and Varela, the individuality of machines is synonymous with their definition as 'living systems' (Maturana 1980: 78-79).

While this approach to defining an individual is of considerable practical use, it has an important limitation. The complete autonomy of individuals that requires they have "no inputs or outputs" (Maturana 1980: 87) limits the usefulness of this model where the interaction between individual and environment becomes important. While Maturana and Varela do admit that an individual may be "deformed" by external events (Maturana 1980: 98), the strength of their definition relies on the marginalisation of these interactions.



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

Given these concerns, the term 'individual' is used with an appreciation that many of the recent approaches to subjectivity call into question the validity of such a rigidly defined notion of individuality. Before discussing these more progressive and critical theories of subjectivity, several more traditional schools will be presented. Within each of these discourses, considerable debate has occurred further refining and delimiting the nature, role and operation of subjectivity.

The Cartesian Subject – Rationality and Dualism

While divergent in many respects, recent approaches to describing the subject universally share a rejection of several key ideas regarding the subject. These ideas were developed following the Enlightenment, as the result of a range of social forces including urbanisation, colonisation, the splintering of the church, and the explosion of literacy following the printing press (Hall 2004: 17). Despite this overdetermination, many still associate the appearance of what has come to be known as the 'Cartesian subject' with Rene Descartes' *cogito*, in which he observes "I think, therefore I am" (Descartes 1968: 54). Descartes' writings capture the nature of the post-Enlightenment Cartesian subject as "a free, autonomous and rational being" (Mansfield 2000: 13), placing individuality and conscious thought at the centre of human experience.

An important aspect of Descartes' is the dualist nature of the subject. While phenomenological observation suggested that the mind was inherently indivisible, the brain was understood to be a malleable, extended material object. As a consequence, Descartes surmised that the mind could not be reducible to brain, resulting in 'Cartesian dualism' whereby the mind (and hence arguably the subject) is an immaterial object connected somewhat tenuously to the material brain. (Feinberg 2001: 107-109)

While such a view of the subject may be aggressively critiqued today, it has formed the basis of much of the present day popular understanding of subjectivity. From literary forms and legislation to economic models and medical decision-making, the modern world operates on the assumptions that the subject and individual are synonymous, and that the individual agent is a rational, autonomous being. The notions of the subject that are discussed below challenge these assumptions. Were they to be more widely adopted within the broad social sphere, they would perhaps necessitate significant shifts in cultural institutions still built on the foundation of the Cartesian subject.

The Social Subject – Multiplicity and Synthesis

As early as the eighteenth century, the Cartesian notion of the subject as a concrete unity was called being into question. Psychologist William James and philosopher David Hume were among first writers to reject the presence of an innate inner "I", proposing that personal experience was less the realm of the divine and more the product of material processes. Hume (Hume 1962) situated the subject within the stream of consciousness, where memory serves to synthesise a consistency of experience from a succession of perceived events. The monolithic



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

nature of the subject was further challenged by James (James 1952) who proposed that subjectivity was inherently multiple. Similarly to Hume, he suggested that the stream of successive mental states was itself responsible for generating the subject. (Feinberg 2001: 5) Seeing plurality in psychiatric patients' experiencing dissociative identity disorders, James warned of an acceleration of this trend in response to the pace of change in industrialized society of the late nineteenth century – a theme which will be touched on again later.

Philosophy (and in James' case, the early stirrings of psychology) provided an individualist critique of the Cartesian subject. In contrast, the emerging social sciences faulted the post-Enlightenment model for its failure to acknowledge the importance of the social environment. While addressing many of the same core issues as philosophical tracts on subjectivity, these writers would refer more often to 'selves' and 'identities'. George Herbert Mead, one of the founders of modern sociology, explicitly situated the subject within social discourse. Mead was the first to write on the essential role of communication and role-taking in development of subjectivity. (Branaman 2001: 169)

This notion of the communicatively constructed social subject was expanded and codified by Erving Goffman (Goffman 1959) employing the notion of 'performative identities'. Within Goffman's dramaturgical framework, identity is constructed in each social situation through individuals enacting tacitly agreed roles. In performing assigned roles, individuals engage with others in social scripts, constructing subjectivity as they are reflected in each other's performance (Massumi 2002: 48). The subject is then responsible for maintaining a perception of cohesion between individual performances of situated identity. Also important to Goffman is the reflexive relationship between subject and society, in which the definition of roles act as a channel. Each individual learns a set of social roles, but over time new roles may be enacted by individuals and gradually become part of the social structure.

The relationship between the individual subject and the society is also of importance to sociologist Anthony Giddens in his description of the 'institutional reflexivity' of modernity. For Giddens, the construction of the subject is reflexive, the "sustaining of coherent, yet continuously revised, biographical narratives" (Giddens 1991: 5). This construction of the subject is problematised by a fragmentation of subjectivity brought about by modernity. The modernist cacophony of social demands and opportunities leads to the saturation of the subject that has been described in some depth by Kenneth Gergen (Gergen 1991). As technology and social change increase the number, variety, and frequency of social relationships and identities that individuals must maintain, the subject becomes populated with multiple, disparate, partial subjectivities. For Gergen, the prognosis is 'multiphrenia' – the splintering of subjectivity and the increasing population of the subject by 'otherness'. Not all critics of the impact of increasing multiplicity are so pessimistic. Robert Lifton suggests that 'plasticity' will allow multiplicity and fluidity without fragmentation and the disappearance of the subject. This plasticity is manifest in the sequential, simultaneous and social nature of an evolving subject that Lifton terms 'protean'. (Lifton 1993)

The evolution of psychoanalytic theory has run parallel to this sociological discourse on subjectivity. The subjective multiplicity that was originally observed by William James found a central place in the psychological models of Sigmund Freud and those that followed. Contrary to the Cartesian picture of a wholly conscious rational mind, Freud proposed the unconscious – a



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

significant portion of the subject that lies beneath the level of conscious awareness. Further, Freud provided a map of the human psyche containing 'id', 'ego' and 'super-ego' – a fundamentally multiple view of the subject. (Hall 2004: 60-61)

It was on the basis of Freudian theory that a number of theorists would begin to construct more radical notions of subjectivity over the twentieth century. Moving away from the earlier concentration on sensory perception in the production of subjectivity, these notions would focus on the importance of language.

The Critical Subject – Enunciation and Performance

Freud was perhaps the first to highlight the important role that language plays in forming subjectivity. The pivotal role of language in the practice of psychoanalysis led to it being referred to as the 'talking cure'. This primacy of language was to be a core part of the work of post-Freudian psychoanalytic theorist Jacques Lacan.

Lacan proposed the existence of an important phase during infant developmental (the 'mirror stage') at which "the subject for the first time knows himself as a unity, but as an alienated, virtual unity" (Lacan 1991: 166). From this point onward, language provides a means to manage tension between fragmentation of that unity and lack of control in an alien environment. (Hall 2004: 80) Through acts of enunciation that delineate the other, the individual constructs subjectivity. As a consequence, the form of an individual's language necessarily defines the nature of that individual's subjectivity (Lacan 1977: 85-86). This type of linguistically embedded subject further challenges the remaining tenets of the individualistic Cartesian model. Entangled with symbolic exchange, the subject is drawn out of each individual toward the spaces between.

The work of Lacan moved the study of subjectivity beyond the realm of philosophical and psychoanalytic discourses regarding the individual. For Lacan and those that followed, discourse regarding the subject was a means of critical examining social and cultural issues. (Mansfield 2000) The very notion of individual subjectivity was critiqued as an historically specific social construction by Michel Foucault, in his exploration of the ways in which industrial society manufactured the modern experience of subjectivity. (Foucault 1977: ; Foucault 1978) It was hoped by Foucault that this analysis would provide guidance in promoting "new forms of subjectivity through the refusal of this kind of individuality that has been imposed on us for several centuries." (Foucault 2000: 336) Importantly, Foucault attacked not just the nature of modern subjectivity, but also individuality. Arguing that the definition of individuals should not be conceived of as natural he believed that it was through the exercise of power that individuals came to be defined (Foucault 1980: 98).

Theorists such as Lacan and Foucault described a process of subjectivation that was fundamentally more dynamic and situated than the absolute rigidity of the Cartesian subject. The transformative potential of this more dynamic approach was seized on by feminist writers such as Julia Kristeva and Judith Butler as an important tool in deconstructing and analysing gender (Mansfield 2000: 73; Hall 2004: 99).



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

By adopting Lacan's belief that the subject is situated within linguistic processes, Kristeva was able to propose a subjectivity that is continually becoming. (Hall 2004: 99) Alternative systems of meaning can then emancipate those oppressed by the present means of subjectivation. The range of discourses from which meaning is drawn to construct the subject also provides an inherent potential for resistance and change. As Catherine Belsey asserts,

"the displacement of subjectivity across a range of discourses implies a range of positions from which the subject grasps itself and its relations with the real, and these positions may be incompatible or contradictory. It is these incompatibilities and contradictions within what is taken for granted which exert a pressure on concrete individuals to seek new, non-contradictory subject-positions." (Belsey 1991: 597)

In further denaturalising subjectivity (particularly with respect to gender), Judith Butler emphasises the role of performance. Similarly to Goffman, Butler foregrounds the space of performativity as crucial to the construction of the subject. Butler sees the body of the individual as "not a 'being,' but a variable boundary, a surface whose permeability is politically regulated, a signifying practice within a cultural field." (Butler 1999) Despite the fact that this performance is culturally situated, Butler denies that pre-existing culture and language limit the expression and construction of subjectivity. Within the existing cultural field, resistance is the performance of de-institutionalising practices, a means through which the individual constructs a subjectivity that rejects the "set of ready-made subjects" allowing the emergence of "a new configuration of politics" (Butler 1999: 189-190).

As a result of theorists from Hume and James to Kristeva and Butler, the rational unity of the Cartesian self has been thoroughly dismantled. Consequently, the subject is multiple not only in its construction and expression, but also multiple in terms of its location within numerous discourses. Extending this movement, several theorists have denaturalised the subject further, beyond the actual and beyond the personal.

The Deleuzian Subject – Assemblages and Connection

A philosophical school of thought emerged in the latter twentieth century that radically decentered humanity, and in doing so presented new and innovative perspectives on the nature of subjectivity. Most notably ascribed to Gilles Deleuze, the approach weaves together eclectic influences including Karl Marx, Sigmund Freud and Wilhelm Reich. (Deleuze 1983) Deleuze's approach also drew on the philosophical thinking of Henri Bergson. Bergson placed perception at the core of experience, situating individual subjectivity between the momentary present perception of the body, and the collection of perceptual memories (Bergson 1988: 161-163). Deleuze excavates and expands on a number of terms from Bergson, particularly the notions of 'duration' and 'multiplicity' (Deleuze 1988: 37-38). Deleuze presents Bergson's 'aspects of subjectivity' in a layered fashion that extends from the pure experience of situated perception to the disembodiment of memory (Deleuze 1988: 52-53). Interestingly, this model shares much in common with the psychological models presented in the next chapter.



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

Critiquing Hume, Deleuze distinguishes between mind and subject. For Deleuze, the subject is considerably more abstract than those discussed previously. For Deleuze, the subject is defined in terms of its autopoietic quality, a subject that “develops itself” (Deleuze 1991: 85) in a habitual synthesis of past and present experience (Deleuze 1991: 94-95). As a result, the Deleuzian subject is strikingly similar to the autopoietic machines of Maturana and Varela (Maturana 1980). Obviously, such an autopoietic synthesis need not be the domain of human individuals, leading to forms of subjectivity that include ‘trans-personal’ groups and institutions, and even the non-organic subjectivity of technologies (Guattari 1992: 9).

In collaboration with psychoanalytically schooled Felix Guattari, Deleuze developed a radical philosophy of concepts such as the ‘machine’ – a term further abstracted from Maturana and Varela to describe a nexus of relations; an entity of flows and stoppage (Deleuze 1983). Such machines – from the organic to the semiotic – articulate with one another to form ‘machinic assemblages’. Each of these assemblages is an “intermingling of bodies reacting to one another” (Deleuze 1983: 88) in what Maturana and Varela described as reciprocal deformation (Maturana 1980: 120). Viewed another way, each of these assemblages is also a ‘collective assemblage of enunciation’, a system of “acts and statements” (Deleuze 1983: 88). This performance of collective assemblage necessarily produces a subjectivity, regardless of the nature of constituent machines. While the assemblage that is a human individual produces subjectivity, so does the assemblage that is a piece of technical machinery, or the assemblage that is an ecosystem.

Such assemblages are multiple – continually establishing connections to one another, resulting in decentralised, rhizomatic networks that negate the primacy of a natural ‘subject’ (Deleuze 1983: 8). Subjectivity within such a philosophy is necessarily “plural and polyphonic” (Guattari 1992: 1) – multiple and dynamic; overlapping and interacting. It is within Deleuze and Guattari that the notion of the individual is most problematised, from both directions. The human body is merely part of many complex momentary assemblages, and simultaneously is merely the transitory collection of other more granular machines. Any ‘individual’ form may be seen as part of another ‘individual’ that is “governed by another, more complex, relation, and so on to infinity.” (Deleuze 1987: 254) As a consequence, each individual is at once an ‘infinite multiplicity’, and the universe becomes “a multiplicity of perfectly individuated multiplicities.” (Deleuze 1987: 254)

Such a view of subjectivity has been embraced by Deleuzian theorist Brian Massumi. Massumi employs a Deleuzian lexicon to chronicle the formation of individual subjectivity. This subjectivity results from the assemblage of an infant and the larger more complex ‘abstract machine’ that is society as a whole (referred to be Deleuze and Guattari as the ‘socius’). (Massumi 1992: 75-77) The socius is not the only abstract machine – Massumi also observes that the individual subject itself is “a transpersonal abstract machine, a set of strategies operating in nature and spread throughout the social field” (Massumi 1992: 26). In keeping with the politics of Foucault, the process of subjectivation that Massumi describes is one of restriction and oppression in which the freedoms of the multiple, plural infant subjectivity are made rigid through the norms of categorisation. (Massumi 1992: 75-77) The possibilities for resistance and creativity expressed by Massumi are rarely exercised through individual subjectivity. Sites for novel expressions are found in subjectivity that is not psychologically intrapersonal, but “transpersonal ... contained in the interactions *between* people” (Massumi



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

1992: 26, emphasis in original). Such suggestions privilege the connectivity of the assemblage, rather than the identity of its constituent machines.

Philosophies of connection and articulation like those of Deleuze and Massumi may seem counterintuitive within the worldview of the individualist, humanist thinkers of the Enlightenment. However, these more radical ontologies have found a natural fit with much of the critical analysis of the networking and interfacing technologies of mediation that have emerged in recent years.



SUBJECT AND TECHNOLOGY

Engaging with technologies is arguably one of the fundamental traits of humanity (Clark 2003). Long before digital mediating technologies, individuals manufactured and co-opted tools to achieve goals often unattainable to the unassisted. The diverse ways in which subject and technology engage has been of interest theorists both generally, and in response to specific technologies.

Predating the use of terms such as 'cyborg' and 'interface', philosophers such as Martin Heidegger and Maurice Merleau-Ponty had already challenged the apparent separation of subject and technology. In describing tool use, Martin Heidegger emphasised the importance of context suggesting that the way in which a tool was employed defined the tool in that moment of use. As a result, no technological machine is autonomous in the way suggested by Hegel. (Heidegger 1977: 17) A given tool no longer had a true inherent nature – it *is* by necessity *what it does* (Ihde 2002: 106). Heidegger also observed that the tool is then incorporated into the way an individual perceives themselves engaging in that activity (Ihde 2002: 7). This suggests a 'cyborg' notion of subjectivity, one in which the technology of the tool has been introjected into the subjective experience of tool use.

Merleau-Ponty also described the production of hybrid cyborg subjectivities when the perception of the individual is extended through technological means such as a blind person's cane. (Merleau-Ponty 1945: 165-166) In this instance, it is not merely that the physical range of perception has been altered. The individual also experiences a sense of embodiment that extends beyond the physical body of the individual. (Ihde 2002: 7) To become accustomed to using a technologies in this way "is to be transplanted into them, or conversely, to incorporate them into the bulk of our own body" (Merleau-Ponty 1945: 166). This consequence of extended embodiment is a natural result of Merleau-Ponty's act of situating perception and action at the core of human subjectivity (Ihde 2002: 37).

More recently, theorists have engaged with the subject/technology dialectic in numerous ways. Writing on the history of technology, Bruno Latour breathes life into technologies, endowing them with the characteristics such as history, culture, and agency – characteristics traditionally denied 'non-humans' (Ihde 2002: 88). In this way, Latour's technologies including the the ill-fated French transportation system 'Aramis' (Latour 1996) gain a subjectivity of their own.

Following his collaboration with Deleuze, Felix Guattari's writings on 'machinic subjectivity' provide a comprehensive analysis of the nature of subjectivities beyond the individual. In describing technologies, Guattari considers the concrete, scientific aspects of these developments as merely part of a greater whole. Extending the notion of 'material apparatus' such as the Internet or mobile telephony beyond the 'technical machine', Guattari includes not just the material components of a technology, but the plans that lead to its fabrication, the individual and collective mental representations of the technology, and the relations that exist with other technologies. Perhaps the most powerful extension is Guattari's inclusion of the 'abstract machines', such as the society and subject, with which the technology intersects. In this way, the society within which a technology exists, and the subjects that engage with it in



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

various ways – material, cognitive, affective and social – all form part of the assemblage that constitutes the technology. The resulting image of a technology is multiple and heterogenous, a highly connected machinic assemblage – a complex ensemble with which other systems can then engage. (Guattari 1992: 34-35)

Within the socius, social roles and norms can also be considered machinic, where each makes up part of the larger machine that is society (Massumi 1992: 75). The subject articulates with the socius at many points and at many moments, each time temporarily forming a machinic assemblage. Such an assemblages act simultaneously at a number of machinic levels, including the semiotic and social (Deleuze 1987: 22). This provides a multiple and heterogenous set of paths by which technologies can engage with individual subjectivities through the medium of society.

When exploring the production of the subject and the effect of mediating technologies, the somewhat complex assemblage of technology, socius, and subject forms a useful framework. The task then becomes one of understanding the components of the socius that transversally engage with both subject and technology to create flow that effects the production of the subjectivity.

Moving to more specific research, the dynamic nature and complexity of emerging technologies combined with the importance of individual subjectivity has led to analysis that places great importance on the outcome of this coupling. Many writers in this area have succumbed to the temptations of hyperbole – painting technologically enmeshed futures as techno-utopias or cybernetic hells.

Utopias and Dystopias

Theorists have envisioned a number of dichotomous futures when considering the engagement of individual subjectivity with emergent machinic assemblages. Advocates often see a progressive world of disembodied 'uploading' (Moravec 1988), or subversive freedom (Stone 1995). Conversely, others predict the disintegration of our very humanity (Lyotard 1991) or the apocalyptic rise of totalitarian machinery of the state (Virilio 1995). At either end of the spectrum, the individual has been dramatically re-engineered in some way – physically or socially – resulting in the arrival of the 'posthuman' subject. (Hayles 1999: 3)

Jean-Francois Lyotard (Lyotard 1991) anticipates nothing less than the complete subsumption of humanity by the machine, in the struggle for continued existence. In response to this, he proposes resistance to the colonisation of humanity by the 'inhuman'. As part of this resistance, Lyotard highlights the importance of maintaining 'difference', a fundamental attribute of humanity. Counter to feminist authors such as Kristeva and Butler, Lyotard identifies gender as a key site for differentiation and hence a necessary aspect of human existence (Lyotard 1991).

While maintaining gender oppositions is vital to Lyotard's resistance of the inhuman, deconstructing those very oppositions is similarly vital the embracing of the inhuman for 'cyber-



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

feminists' such as Haraway (Haraway 1991). Again acknowledging the performative nature of a social reality that is constructed by 'lived social relations' (Haraway 1991: 149), Haraway uses the notion of the post-human cyborg to critique the rigidity of contemporary society. In a world where we are all "hybrids of machine and organism ... the boundary between physical and non-physical is very imprecise" (Haraway 1991: 153). And in such a world, identity is necessarily partial and contradictory, strategic and impermanent.

Numerous researchers have examined the social causes and consequences of this multiple and fluid identities described by Haraway and others. Flexible online identity behaviour (such as gender-switching) was seen as an indication that the Internet provided 'extraordinary freedom' to construct more fluid identities and "escape being categorized according to age, race, biological sex, and a host of other social factors." (Roberts 1999: 522)

Turkle (Turkle 1995) describes instances where identity-work carried out online facilitated a more positive reality, while Hillier, Kurdas and Horsley (Hillier 2001) interviewed a number of young people who found the Internet was an ideal site to 'come out' and explore sexual identity in ways that could then be taken back to reality.

Many of the most significant emerging technologies are technologies of connection. William Mitchell asserts the importance of this when he suggests that "[c]onnectivity has become the defining characteristic of our twentyfirst-century urban condition" (Mitchell 2003: 11), a world in which individuals are themselves nexuses of connection – each "a biological core surrounded by extended, constructed systems of boundaries and networks." (Mitchell 2003: 7) These networks are not new; individuals have always existed enmeshed in systems of flow – networks of food, energy, transportation and so forth. The maintenance of the networked individual becomes a process of controlling these networked flows (Mitchell 2003: 9). This control is achieved through engagement with ever more complex technologies. Unlike their predecessors, modern technologies foreground this management of flow, characterised by their ability to distribute and regulate. (Heidegger 1977: 16)

For Mitchell, the networks within which the individual exists are a "means of knowing and acting upon the world" (Mitchell 2003: 61), mediating the social, economic and cultural aspects of existence – and hence the experience of subjectivity. More explicitly, engaging with these networks demands that an individual declare aspects their identity (Mitchell 2003: 61) – from 'swiping in' at work to parking in a disabled car space. In this way, individuals are continuously performing their identity as they enact network connections. Subjectivity becomes a result of this actualised network flow.

While acknowledging the potential for oppression within such a world-view, Mitchell is unabashedly optimistic - "[d]isconnection would be amputation. ... I am part of the networks, and the networks are part of me. ... I link, therefore I am." (Mitchell 2003: 62)

Perhaps more balanced prospects for the future lie between utopias of Mitchell and other techno-evangelists, and dystopias such as Lyotard's. Guattari suggests that machinic evolution is neither inherently positive nor negative, that the outcome of our ongoing advances will depend on how we engage with these technologies. (Guattari 1992: 5) Further, in acknowledging the



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

role that technologies already play in our lives, other writers have suggested that we have already become both posthuman (Hayles 1999: 6) and cyborg (Haraway 1991: ; Clark 2003).

Cybernetic Technologies

The technologies on which this project focuses are those which form intimate machinic assemblages with the subjectivity of the individual. Technologies that establish relations with individuals in this way have previously been described as 'cybernetic' (Hayles 1999), and that term seems appropriate here. Computer mediated communication and mobile telephony are two examples of such cybernetic technologies.

In comparing new cybernetic and informational technologies to the previous industrial technologies, Deleuze and Guattari emphasise the internalisation of the means of articulation between individual and machine. With the advent of cybernetic technologies, "the relation between human and machine is based on internal, mutual communication, and no longer on usage or action." (Deleuze 1987: 458)

Cybernetic technologies articulate with social and human machinery at many levels. From swiping credit cards to working for globally redistributed call centres, groups and individuals are enmeshed within a range of machinic assemblages. The production of subjectivity occurs at many levels within these assemblages. This articulation of human and machine is often seen as heralding the arrival of the 'posthuman' subject, "an amalgam, a collection of heterogenous components, a material-informational entity whose boundaries undergo continuous construction and reconstruction." (Hayles 1999: 3)

In almost all instances, the subject is extended into another form of 'body' (physical or digital). Outside of Eastern meditations traditions (Varela 1991), it is uncommon for the subject to be extended in some disembodied form. As Clark suggests, "embodiment is *essential but negotiable*" (Clark 2003: 114, italics in original). The assumption underlying this is that subjectivity is being constructed on the basis of present perception, and that the brain can "quite readily project feeling and sensation beyond the biological shell." (Clark 2003: 62) These notions of negotiated embodiment are at the heart of posthuman theory, and the related notion of the cyborg.

Perhaps one of the most critiqued practitioners in this field is performance artist and theorist, Stelarc. His work "invites us to explore a new realm of complex and multiple embodiment, with an associated expansion and enrichment of the subjective sense of self" (Clark 2003: 117). Engaging with technologies in a concrete, physical way, Stelarc demonstrates the fluidity of the production of subjectivity. His approach to technology is a material one, wherein boundaries are erased by the rupture of the skin, and the invasion of the body (Stelarc 2000: 563). He suggests that as a consequence, any residue of the Cartesian subject is destroyed.

In a more pragmatic sense, Stelarc's work demonstrates our capacity for flexibility in perceiving our environment and controlling our actions. His work often involves the utilising an existing sensory channel (such as tactile sensation) to deliver new perceptual information. After limited



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

exposure to such novel forms of stimuli, incorporating alternative sensory and control information “is so easy and fluent that all we experience is a fluid, apparently unmediated mesh between will and motion.” (Clark 2003: 120) Experience such as this indicates that the development of biologically intrusive interfaces such as cortical implants is not necessarily a precursor for dramatically reconfiguring subjectivity.

This variable and flexible engagement with technology is also compatible with Judith Butler’s understanding of body as a malleable and permeable boundary on which signifying performance occurs, generating subjectivity (Butler 1999). Such a nebulous body need not end at the skin, but could conceivably be extended and augmented to incorporate mechanical and digital components. Seeing organic, mechanical, and digital bodies as a single assemblage, they become a single surface for the performance of identity.

Virtual Reality and Digital Avatars

In contrast to many cyborg visions, virtual reality rarely requires violation of the body, and does not call so dogmatically for the eradication the subject. Virtual reality could be seen as examining “conditions and construction of selfhood through projecting one’s self and one’s agency [into virtual spaces]” (Gromala 2000: 599).

The technological nature of interfaces within virtual reality and cyborg literature ranges from the non-intrusive (screens, helmets and data-gloves) to the extremely intrusive (cortical implants and surgical prostheses). It is general expected that more intrusive interfaces will lead to greater negotiability of subjectivity. While this may be the case, there is evidence to suggest that considerable flexibility can exist even with the most rudimentary of interfaces as mentioned above with reference to Stelarc’s work. Andy Clark is a multidisciplinary theorist of cognition who suggests that while direct cortical interfaces will have advantages, they are by no means necessary. Clark explains that the important aspect of an interface is the provision of reliable “incoming signals properly correlated with both the subject’s own self-directed exploratory activity and with the changing states of the world.” (Clark 2003: 126) Research involving prosthetic visual systems has supported this. These systems assist blind patients by capturing visual data and delivering it to the patient through either an array of haptic stimulation, or direct cortical stimulation. Evidence suggests that the effectiveness of such systems is dependent on factors such as the speed of information flow (Dennett 1991: 341), and that the patient’s experience is dramatically affected by lag within the system (Clark 2003: 105). Clark proposes that “direct responsiveness is a major factor in the creation of our sense of bodily presence” (Clark 2003: 131) and suggests that communication across the interface must be “sufficiently rich, fluid, bi-directional, fast, and reliable” to allow the technology to “function more like a proper part of the user.” (Clark 2003: 103). Aspects such as this form the requirements for interfaces that will allow the extension of subjective experience beyond the body of the individual into external mechanical systems.

One challenge facing those who advocate the permeability of the body/technology interface and the irrelevance of the organism (or ‘skin bag’ as Clark refers to it) is the limited modality of interfaces. The most common interfaces commercially available are limited to the video and audio sensory input, a cultural bias over other senses such as the haptic, kinaesthetic and



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

proprioceptive (Gromala 2000: 607). These challenges are not as significant as they seem, suggests Clark, as “our brains are amazingly adept at learning to exploit new types and channels of input.” (Clark 2003: 126). From the neurological point of view, the relationship between a sensation or action and the neural image of that event has always been “somewhat arbitrary.” (Clark 2003: 131) Demonstrating this modal flexibility, individuals using visual prosthetics that create haptic sensation in place of visual data report ‘quasi-visual sensations’ after limited exposure. After sufficient training, “they cease to notice the bodily stimulations and instead directly experience objects arrayed in the space in front of the camera.” (Clark 2003: 126)

Much of this research into the extension of the embodied subject through cybernetic technology has employed a range of physical prosthetics. An alternative to this is the use of a prosthetic within a digital space rather than a physical space. To engage with an virtual environment, the individual may be provided with an ‘avatar’ – an image representing the individual’s agency and embodying their point of view within the digital space (Davis 1998: 219; Figueroa-Sarriera 1999: 133). Such representations can be as apparently simple as an online name, or as complex as a digitally rendered humanoid form.

In studying the use of avatars, scholars have observed considerable emotional investment and identification. A number of the more theoretically enmeshed analyses of these effects have highlighted the importance of embodiment and spatiality, asserting that a qualitative change in online interaction occurs when “[a]gents meet face to face” (Stone 2000: 112). Even in purely textual environments, the (textually invoked) body is still an important aspect of the most powerful online experiences – such as the infamous ‘LambdaMOO rape’ (Turkle 1995: 251).

William Egginton describes the relation individuals have with avatars as “extraordinarily tight”, suggesting that “an avatar experiences for a master; it is a prosthesis through which the master feels his or her way through a world he or she cannot physically enter, and feels emotionally the presence of others, a presence entirely mediated through, and therefore dependent upon, the identity of his or her avatar.” (Egginton 2003: 11)

As a cyborg-like entity, the ensemble of the material body of the individual and the digital body of the avatar has numerous implications. Stelarc questions the capacity of such a digital body to be part of the subject, given that it is “acting without expectation, producing movements without memory” (Stelarc 2000: 576). Engaged with the avatar, does the subject become “situated beyond the skin”, through an “extruding of awareness”? (Stelarc 2000: 576)

A number of experiments suggest that this extension of embodiment is not unusual. (Armel 2003: ; Clark 2003: ; Holmes 2004) As part of its basic biological function, the experience of embodiment causes individuals to act in response to potential harm with a number of involuntary physical responses. These include galvanic skin response, heart rate, and respiration. When the individual is threatened, these responses prepare the body. Experiments have shown that where the individual can be ‘fooled’ into extending their subjectivity into external objects (such as false hand), damage to those objects will result in the triggering of these involuntary responses. (Armel 2003: ; Clark 2003: 59)



Language as Technology

Digital avatars allow individuals to engage with technology at an embodied level of perception and action. To appreciate more abstract articulation between subject and technology, it is necessary to incorporate an additional technology – that of language. Through the complex operation of the socius, technologies may alter aspects of language. Drawing on the linguistic and performative notions of the subject, these changes to language may in turn alter the way in which individuals produce subjectivity.

The naturalisation of language often occludes an appreciation of the degree to which it is essentially an external set of practices, and hence a technology. Seeing language as a set of productive ‘order-words’ rather than a medium for the communication of meaning (Masumi 1992: 41) emphasises its tool-like qualities. Each speech act is an instance of tool-use; each order-word a tool, relating a word or statement to social transformations (Deleuze 1987: 81).

To further appreciate language as a form of technology, it is useful to examine the role of language through the perspective of embedded cognition. Clark suggests that through the “simple act of labelling”, we are able to engage in cognitive processes that are fundamentally not possible with a ‘languageless mind’ (Clark 2003: 72). By labelling our thoughts, they become stable objects – objects that can in turn become the focus of our own attention (Clark 2003: 87). Further, once we have learned a series of words and a level of syntax, we can then compose our own sentences. At that point, those sentences themselves become objects to which we can then attend (Clark 1997: 209). Several theorists have suggested that the self-reflexive nature of language cognition is a more definitive distinction between human and non-human species than any other genetic or behavioural difference. (Clark 2003)

An important aspect of language is that as it is adopted and these new objects become cognitive assets, it appears that individuals’ thoughts themselves are composed of the words and sentences of language (Clark 1997: 197). Linguistic resources also become part of our reasoning process (Clark 1997: 207). Language becomes a crucial asset both as a means of interpersonal communication of ideas when directed toward others, and as a cognitive tool when self-directed (Clark 1997: 195).

The degree to which language, cognitive processes, and conscious experience are intertwined often blinds individuals to the separation between the social construction that is language, and the organic strata of the organism that plays host to it. Humanity at times seems as closely enmeshed with language as with genetic form. This is further exacerbated by the possibility that learning language appears to alter the brain itself – either profoundly as Dennett believes, or in a more limited way as Clark suggests (Clark 1997: 198). Despite this, it is important to maintain a distinction. The individual can still exist, without the benefit of language. Further, in the view of most theorists subjectivity can still be produced – counter to this, Lacanian thought may argue that no subjectivity can be developed without language.

The emergence of mediating technologies has resulted in a number of changes to the society that may have repercussions within linguistic space. In turn, these changes may then produce alternative means of subjectivation. In his comprehensive critique of ‘the network society’,



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

Castells analyses the social importance of information technologies. Two dominant trends that are identified within this analysis are the importance of networks (Castells 2000: 500) and the acceptance of the reality of the virtual (Castells 2000: 403).

Each of these concepts is multiple and complex, and can be articulated with the production of the subjectivity in various ways. The logic of networks encompasses notions of interconnection, of flows, of the importance of connection over location. The conceptual aspects of the network are described by Deleuze and Guattari in their exposition of the 'rhizome' concept. (Deleuze 1987)

In addition to the importance of network ontologies, Castells describes the emergent global society as a "culture of real virtuality" (Castells 2000: 403). As individuals become more familiar with digital technologies of mediation, the distinction between the 'real' and the 'virtual' dissolves. This leads to questioning the concreteness of reality as well as greater expectations of manifestation of the virtual. Further, it encourages individuals to understand that these two apparently opposed categories are not necessarily exclusive.

As aspects of the way individuals act and interact, these notions of networks and real virtuality reside within the structure of the society – the socius. As a consequence, they have the capacity to engage with the subject and provide new means for the production of subjectivity. One of the consequences of this will be changes in the way individuals use language to describe ourselves, the way they narrate their subjective experience.



SUBJECT AND SELF

This chapter has presented an overview of theoretical approaches to subjectivity, and to the ways in which subjectivity engages with technology. The remainder of the chapter will strive to narrow the focus of discussion from subjectivity as a whole to a single aspect of the subject – the individual self. In focussing on subjectivation at the level of the individual, this project examines the way in which mediating technologies articulate with processes responsible for the production of an individual's personal sense of self. Unlike the production of subjectivity at other levels such as groups and institutions, these processes are anchored in the individual's embodied experience, supported by the material strata of the body, brain, and immediate environment. The individual self is a complex cognitive model residing at the core of individual subjectivity, facilitating interaction with a complex environment.

Reflexive Individual Subjectivity

In defining the scope for investigation, it is necessary to narrow from discussed notions of 'subjectivity' to the more pragmatic and restricted idea of self. Most simply, the self is that part of subjectivity that is both individual and reflexive. Conversely, aspects of subjectivity that lie outside the individual, or do not refer reflexively to the individual are not part of the self. Produced by numerous processes within the individual, it is perhaps useful to view the self as both an assemblage of numerous heterogenous 'self-machines', and simultaneously as part of the heterogenous assemblage that forms the subject.

As discussed below in some detail, the machinery of the self consists of a range of processes and representations of the individual that vary in scope and function. At their most basic, these provide a means of "distinguishing self from world, inside from outside" (Dennett 1991: 414), a basic biological function necessary for the operation of any autopoietic system. Yet from these simple models of the state of the individual, iteratively more complex forms of selfhood are constructed. Beyond the moment-to-moment biological self, an experiential psychological self is produced, which in turn lays the foundations for a narrative self – a linguistic construction built of narrative conventions and social identities.

The self, as it is defined here, is concrete and bounded. It is nothing more (or less) than "a vulnerable pattern of integrated operations whose consequence is to generate the mental representation of a living individual being." (Damasio 2000: 145) While we may be conscious of aspects of its functioning, it does not rely on consciousness for its existence. The self is a set of mental processes and their products – constructed within and bounded by the limits of the human nervous system. These limitations allow some comparison between the self as a mere mental image, and the more complex and abstract notions of subjectivity described above.

It is useful at this point to return briefly to Maturana and Varela's definition of living systems as autopoietic machines. The self is vital in allowing an individual to maintain homeostasis by providing an internal model of the autopoietic system. This model facilitates the maintenance of system within the boundaries of the individual's 'homeostatic states'. It is these bounds that



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

define the individuality or identity of the system (Maturana 1980: 87, 97). The notion of self as internal representation fits well within this model, though Maturana and Varela stress that such representations are not a necessary component of all autopoietic systems. Consequently, this suggests that the self is not a necessary part of all living systems.

Despite the apparent simplicity of the self, the examination that follows demonstrates its considerable internal complexity. Further, the interaction between its internal elements produces a selfhood that is both dynamic and non-linear in character. Before beginning a comprehensive systemic analysis of the self in the next chapter, it is important to understand the process by which this unique cognitive assemblage has evolved – from its basic origins in the nervous responses of single-celled organisms to the emergence of conscious and rational thought.

As with subjectivity, the self has been explored from the viewpoints of numerous academic discourses. Three distinct traditions will be presented here, illustrating the similarities and differences between various notions of the self.

The Psychoanalytic Self

As described above, the Freudian tradition of psychoanalysis has been one of the richest sources of inspiration and controversy in recent debates on subjectivity. Its influence can be seen in theories ranging from the 'post-Freudian' work of Jacques Lacan, Eric Erikson (Erikson 1968) and Wilhelm Reich, to the aggressively anti-psychoanalytic 'schizoanalysis' of Deleuze and Guattari (Deleuze 1983).

An important aspect of Freudian theory was that it described the internal structure of the psyche of the individual – offering one of the first comprehensive models of the self. Several aspects of this model are important in understanding its influence on the evolution of psychoanalytic models of selfhood.

Firstly, the model was multiple and heterogenous. It describes numerous systems (such as the id, ego, and superego) operating in parallel. Secondly, the model included an unconscious. Not all aspects of the self were available to conscious introspection. Thirdly, the self could be altered over time as indicated by the practice of psychotherapy. Fourthly, the model was inherently social in that the self was developed through interaction with others (though this was restricted to the triad of the family). Finally, Freud proposed a staged developmental process in which the self was established through the negotiation of a series of critical issues encountered during the first few years of life. Each of these underpinnings had significant repercussions on the way psychologists were to begin thinking about the self.

This developmental model was then extended by a number of Freudian theorists including Eric Erikson. Erikson described a number of further stages that individuals in later childhood and adulthood bringing about further maturation of the self. (Erikson 1968) Erikson suggested that adolescence was also an important period for identity formation as society provided a period of 'moratorium' for role exploration. Interestingly, online researcher Sherry Turkle (Turkle 1995)



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

drew from Erikson's model when she suggested that the Internet use also provides a type of 'moratorium' for identity experimentation (Turkle 1995: 185).

The Freudian developmental model of the self was further refined by Daniel Stern, in his work with infants. (Stern 1985) Stern synthesised post-Freudian developmental theory with observational evidence of infant development to produce a more robust model of the self developing during the first years of life. Importantly, this model emphasises the ongoing relevance of pre-linguistic aspects of selfhood.

Stern's observations suggest that the basic processes of self-construction are put in place between birth and approximately two years of age. At roughly eighteen months, a significant change occurs as infants begin employing spoken language. (Stern 1985) The adoption of language and the cognitive processes it requires have such a dramatic impact that a schism is apparent between elements of the self developed pre-linguistically (which Stern refers to as the 'core self'), and those developed following the adoption of at least rudimentary language (the 'verbal self' and 'narrative self'). Given the bias of many theories of subjectivity toward conscious aspects of experience, there is a tendency to assume that the more basic unconscious processes of self are made obsolete by linguistic activity. Stern explicitly denies this, asserting that all aspects of the self that are constructed "remain forever as distinct forms of experiencing social life and self." (Stern 1985: 32)

Stern's 'core self' relies on ability to of an individual to visually distinguish between parts of the organism and the environment. This self knowledge is produced by integrating three important sources of relative invariance – self-agency, self-coherence and self-continuity (Stern 1985: xix). Together, these constants provide the basis for the development of an embodied sense of self. In the next chapter, these invariants will form an important part of the pre-linguistic model of self.

The Neurobiological Self

While the psychoanalytic tradition has continued to evolve, progress in psychological research into the biological operation of the brain has also provided many significant insights into the nature of the self (Varela 1991: ; Damasio 2000: ; Feinberg 2001). The traditional technique of observing patients with a variety of traumas and lesions to the brain has been augmented in recent years by use non-invasive medical technologies. Research into neurological chemistry and the nature and function of neurons has also contributed significantly.

Within the life sciences, the self can be understood as an evolutionary response to a dynamic hostile environment, serving to maintain the stability required within an organism to ensure continued life (Damasio 2000: 134-135). Neurologist Antonio Damasio believes that such an environment necessitates that organisms develop the ability to understand their state and respond to maintain healthy homeostasis. In simple environments, a simple representation of the physical state ('internal milieu') of the is sufficient to enable appropriate response (Damasio 2000: 135-136). This allows single-celled organisms, for instance, to maintain a number of internal variables within comfortable parameters.



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

As organisms become more complex, they exist within more complex environments. Maintaining homeostatic (or heterostatic) states requires a more complex internal model of aspects of the organism – a reflexive representation that begins to form a basic sense of self. In his philosophical analysis of consciousness and self, Daniel Dennett describes this fundamental, hardwired nervous system as a ‘biological self’ (Dennett 1991: 414). Through a process of evolution, these representations have iteratively become more complex, allowing more detailed maintenance of the organism’s biological systems. Eventually organisms acquired the ability to mentally manipulate representations of the self. This enables these organisms to construct counter-factual mental images, anticipate situations, plan for eventualities, and explore possibilities. These abilities have become powerful tools for survival in increasingly complex and unpredictable environments.

The biological descriptions of the self presented by Dennett and Damasio rely on a rigid delineation between the ‘inside’ and ‘outside’ of the organism. This is the traditional life sciences model of the individual and the self – the body, driven by the brain, is situated within an environment to which it is dialectically opposed. This worldview has been criticised by a number of theorists, including those suggesting a more ‘embedded’ view of cognition.

Embedded Cognition

Andy Clark has championed the embedded cognition approach, where the brain, body and environment are interdependent aspects of a single complex and dynamic system (Clark 1997). Such an approach requires a rethinking of the notions of individuals and embodiment. Clark suggests that

“we need to understand that the very ideas of minds and persons are not limited to the biological skin-bag, and that our sense of self, place, and potential are all malleable constructs ready to expand, change, or contract at surprisingly short notice.” (Clark 2003: 33)

In this malleable space, the self is no longer the rigid central cognitive structure at the centre of an individual identity. Instead, it has become a ‘soft’ self, “a rough-and-tumble, control-sharing coalition of processes – some neural, some bodily, some technological.” (Clark 2003: 138) Further, this self is no longer defined and limited by our own biological structure, reflecting instead “our ongoing experience of thinking, reasoning, and acting within whatever potent web of technology and cognitive scaffolding we happen currently to inhabit.” (Clark 2003: 45) Clark uses the term ‘scaffolding’ (after Vygotsky) to refer to physical, cognitive and social structures within the environment with which we can engage, extending our abilities. (Clark 1997: 194) Such a definition has obvious resonance with several of the definitions of ‘technology’ presented earlier in this chapter.

Despite this radical weakening of the rigidity of roles and distinctions, Clark acknowledges that the brain is still a viable object for study as the location of a core set of basic cognitive resources, tied to our conscious experience. These moments of consciousness however are, “at best snapshots of the self”, which he reminds can only be explained when the assemblage of brain, body and world is acknowledged. (Clark 1997: 216-217)



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

The embedded cognition approach provides a powerful framework for the examination of individual's interaction with mediating technologies. Emphasising the interplay between the (malleable) individual and (equally malleable) technologies, Clark's notions of 'scaffolding' and 'coalitions of shared control' begin to structure thinking about such interactions. This approach can also be applied to linguistic forms of self, given the assertion that language itself is an external construct (or scaffold) (Clark 1997: 191). In this way, language forms an ensemble of technologies with which the self is engaged. Just as each technology displays physical extension with which the body may interact, so many technologies are extended into discourse in various ways – providing novel forms of language with which the speaking individual can engage.

These psychoanalytic, neurological and embedded descriptions of the self appear distinct and in certain instances contradictory. The next chapter will demonstrate their convergence by synthesising a single model of the self through the dialogue between these discourses. The resulting model will have the strong connection with subjective experience that has been retained by the psychoanalytic tradition, while employing the biological and mental constructs of neuropsychology to give richness to the internal structure of aspects of the self. Perhaps most importantly, the incorporation of the tenets of embedded cognition will provide a powerful means of articulating these aspects of the self with technologies at both the material level of perception and action as well as the semiotic and social level of language and narrative.



REFERENCES

Armel, K. C. R., V. S. (2003). "Projecting Sensations to External Objects: Evidence from Skin Conductance Response." Proceedings of the Royal Society, B., Biological Sciences **270**(1523): 1499-1506.

Belsey, C. (1991). Constructing the Subject, Deconstructing the Text. Feminisms: An Anthology of Literary Theory and Criticism. R. H. Warhol, Diane Price. New York, W. W. Norton.

Bergson, H. (1988). Matter and Memory. New York, Zone Books.

Branaman, A. (2001). Introduction to Part III. Self and Society. A. Branaman. Oxford, Blackwell.

Butler, J. (1999). Gender Trouble: Feminism and the Subversion of Identity. New York, Routledge.

Castells, M. (2000). The Rise of the Network Society. Oxford, Blackwell Publishers.

Clark, A. (1997). Being There: Putting Brain, Body, and World Together Again. Cambridge, MIT Press.

Clark, A. (2003). Natural-Born Cyborgs: Minds, Technologies, and the Future of Human Intelligence. Oxford, Oxford University Press.

Damasio, A. (2000). The Feeling of What Happens: Body, Emotion and the Making of Consciousness. London, Random House.

Davis, E. (1998). Techgnosis: Myth, Magic and Mysticism in the Age of Information. New York, Harmony Books.

Deleuze, G. (1988). Bergsonism. New York, Zone Books.

Deleuze, G. (1991). Empiricism and Subjectivity : An Essay on Hume's Theory of Human Nature. New York, Columbia University Press.

Deleuze, G. G., Felix (1983). Anti-Oedipus: Capitalism and Schizophrenia. Minneapolis, University of Minnesota Press.

Deleuze, G. G., Felix (1987). A Thousand Plateaus: Capitalism and Schizophrenia. Minneapolis, University of Minnesota Press.

Dennett, D. (1991). Consciousness Explained. London, Penguin.

Descartes, R. (1968). Discourse on Method and the Meditations. London, Penguin.

Egginton, W. (2003). How the World Became a Stage: Presence, Theatricality and the Question of Modernity. Albany, State University of New York Press.

Erikson, E. H. (1968). Identity: Youth and Crisis. New York, W.W.Norton.

Feinberg, T. E. (2001). Altered Egos: How the Brain Creates the Self. Oxford, Oxford University Press.



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

- Figuroa-Sarriera, H. J. (1999). In and Out of the Digital Closet: The Self as Communication Network. Cyberpsychology. A. J. P. Gordo-Lopez, Ian. London, MacMillan Press.
- Foucault, M. (1977). Discipline and Punish: The Birth of the Prison. London, Penguin Books.
- Foucault, M. (1978). The History of Sexuality, Volume 1: An Introduction. New York, Random House.
- Foucault, M. (1980). Power/Knowledge. New York, Pantheon Books.
- Foucault, M. (2000). The Subject and Power. Power, Essential Works of Foucault, 1954-1984. J. D. Faubion. New York, The New Press.
- Gergen, K. J. (1991). The Saturated Self: Dilemmas of Identity in Contemporary Life. New York, Basic Books.
- Giddens, A. (1991). Modernity and Self-Identity: Self and Society in the Late Modern Age. Stanford, Stanford University Press.
- Goffman, E. (1959). The Presentation of the Self in Everyday Life. London, Penguin Books.
- Gromala, D. (2000). Pain and Subjectivity in Virtual Reality. The Cyberculture Reader. D. K. Bell, Barbara, M. London, Routledge.
- Guattari, F. (1992). Chaosmosis: An Ethico-aesthetic Paradigm. Sydney, Power Publications.
- Hall, D. (2004). Subjectivity. New York, Routledge.
- Haraway, D. (1991). Simians, Cyborgs and Women: The Invention of Nature. London, Free Association.
- Hayles, N. K. (1999). How we Became Posthuman: Virtual Bodies in Cybernetics, Literature and Informatics. Chicago, University of Chicago Press.
- Heidegger, M. (1977). The Question Concerning Technology and Other Essays. New York, Harper and Row.
- Hillier, L. K., C.; Horsley, A. (2001). "It's Just Easier" The Internet as a Safety-Net for Same Sex Attracted Young People. Sydney, Australian Research Centre in Sex, Health and Society.
- Holmes, N. P. C., Gemma A.; Spence, Charles (2004). "Extending or projecting Peripersonal Space with Tools? Multisensory Interactions Highlight Only the Distal and Proximal Ends of Tools." Neuroscience Letters **372**: 62-67.
- Hume, D. (1962). A Treatise on Human Nature. London, Collins.
- Ihde, D. (2002). Bodies in Technology. Minneapolis, University of Minnesota Press.
- James, W. (1952). The Principles of Psychology. Chicago, Encyclopaedia Britannica.
- Lacan, J. (1977). Ecrits: A Selection. New York, Norton.
- Lacan, J. (1991). The Seminar of Jacques Lacan Book II: The Ego in Freud's Theory and in the Technique of Psychoanalysis 1954-1955. New York.



NOTIONS OF SUBJECT, TECHNOLOGY AND SELF – Brett Rolfe (2005)

- Latour, B. (1996). Aramis or the Love of Technology. Cambridge, Harvard University Press.
- Lifton, R. J. (1993). The Protean Self: Human Resilience in an Age of Fragmentation. New York, Basic Books.
- Lyotard, J.-F. (1991). The Inhuman: Reflections on Time. Stanford, Stanford University Press.
- Mansfield, N. (2000). Subjectivity: Theories of the Self from Freud to Haraway. Sydney, Allen & Unwin.
- Massumi, B. (1992). A User's Guide to Capitalism and Schizophrenia: Deviations from Deleuze and Guattari. Cambridge, The MIT Press.
- Massumi, B. (2002). Parables for the Virtual: Movement, Affect and Sensation. London, Duke University Press.
- Maturana, H. R. V., Francisco J. (1980). Autopoiesis and Cognition: The Realization of the Living. Dordrecht, Kluwer Academic Publishers Group.
- Merleau-Ponty, M. (1945). Phenomenology of Perception. London, Routledge.
- Mitchell, W. J. (2003). Me++: The Cyborg Self and the Networked City. Cambridge, The MIT Press.
- Moravec, H. (1988). Mind Children. Cambridge, Harvard University Press.
- Roberts, L. D. P., M. R. (1999). "The Social Geography of Gender-Switching in Virtual Environments on the Internet." Information, Communication & Society 2(4): 521-540.
- Stelarc (2000). From Psycho-Body to Cyber-Systems: Images as Post-Human Entities. The Cybercultures Reader. D. K. Bell, Barbara, M. London, Routledge.
- Stern, D. N. (1985). The Interpersonal World of the Infant: A View from Psychoanalysis and Developmental Psychology. New York, Basic Books.
- Stone, A. R. (1995). The War of Desire and Technology at the Close of the Information Age. Cambridge, The MIT Press.
- Stone, A. R. (2000). Will the Real Body Please Stand Up? Boundary Stories About Virtual Cultures. The Cybercultures Reader. D. K. Bell, Barbara, M. London, Routledge.
- Turkle, S. (1995). Life on the Screen: Identity in the Age of the Internet. New York, Simon & Schuster.
- Varela, F. J. T., Evan; Rosch, Eleanor (1991). The Embodied Mind: Cognitive Science and Human Experience. Cambridge, MIT Press.
- Virilio, P. (1995). The Art of the Motor. Minneapolis, University of Minnesota Press.

