Article

Prosthetic Surveillance: the medical governance of healthy bodies in cyberspace

Emma Rich

School of Sport and Exercise Sciences, Loughborough University, UK. [mailto: E.J.Rich@lboro.ac.uk](mailto:E.J.Rich@lboro.ac.uk)

Andy Miah

University of the West of Scotland, UK.

Abstract

This paper examines how ‘surveillance medicine’ (Armstrong 1995) has expanded the realm of the medical gaze via its infiltration of cyberspace, where specific features of healthism are now present. Drawing on Foucault’s notion of biopower, we examine how digital health resources offer new ways through which to discipline individuals and regulate populations. The emergence of health regulation within and through cyberspace takes place in a context wherein the relationship between the body and technology is rendered more complex. Departing from early literature on cyberspace, which claimed that the body was absent in virtual worlds, we articulate a medicalized cyberspace within which the virtual and corporeal are enmeshed.

The range of health issues articulated through surveillance discourses are many and varied, though of significance are those related to weight and health, as they provide a particularly rich example through which to study medical surveillance in cyberspace due to their moral and regulative focus. We argue that the capacity for health resources to encourage disciplinary and regulative practices defies the designation of *virtual*, as non-reality. Moreover, with the advent of a range of digital platforms that merge entertainment with the regulation of the body, such as Internet based nutrition games, and the use of games consoles such as *Nintendo wii fit*, cyberspace may be providing a forum for new forms of regulative practices concerning health. These virtual environments expand our understandings of the boundaries of the body, since much of what takes place occurs through both a virtualization of identity, such as the use of an avatar or graphic image of one’s body on screen, and a prostheticisation of the body within cyberspace. To conclude, while surveillance medicine regulates physical selves in real time, we argue that there is a growing tendency towards a *prosthetic surveillance*, which regulates and defines bodies that are *simultaneously* hyper-text and flesh.

Introduction

Increasingly, everyday activities are scrutinized and subjected to the burden of medical discourses, where seemingly unrelated features of our lives can now be recast through medical language. In turn, this scrutiny manifests itself as a lived experience of heightened health risks and the imperatives that accompany this have a bearing upon what kind of lifestyles are deemed acceptable for people to lead. This process of medicalization has had a significant impact on lived experience by introducing ‘into previously unproblematic experiences evaluative discourse/meanings, evaluative criteria, which moreover, are presented as socially neutral, technical terms’ (Komesaroff 1995: 4). This expansion of medicine into various cultural sites has long been acknowledged since Conrad’s (1992) and Illich’s (1975) earlier theses on the concept of medicalization. While the deployment of medical surveillance a new, ubiquitous feature of contemporary culture has emerged, as a number of authors (see for example Metzl and Herzig, 2007;

Rich, Emma and Miah, Andy. 2009. Prosthetic Surveillance: The medical governance of healthy bodies in cyberspace. *Surveillance & Society* 6(2): 163-177.

<http://www.surveillance-and-society.org> | ISSN: 1477-7487

© Emma Rich and Andy Miah. 2009. | Licensed to the Surveillance Studies Network under a [Creative Commons Attribution Non-Commercial No Derivatives license](#).

Rose 2007) have revealed: ‘medicalization is a much more complex, ambiguous, and contested process than the “medicalization thesis” of the 1970s implied’ (Ballard and Elston 2005: 228). Indeed, this process has become more complex in recent years due to the following, key cultural shifts in the constitution of health.

Firstly, it is now well recognised that contemporary culture is saturated with an ‘endless series of health scares that are reinforced by governments and health agencies, which encourage an individual responsibility for disease’ (Fitzpatrick 2001: 1). The proliferation of moral panics around health and illness reflects a wider process in the ‘politicization of individual lifestyles’ (Furedi 2005), which cultivates ‘vulnerability’ (*ibid*) and fear. In turn, this fear is positioned as a justification for intervening in peoples’ private lives. For example, recent fears about a growing obesity epidemic in western society have been accompanied by an assemblage of policies and interventions, which seek to alter peoples’ lifestyles (see Gard and Wright 2005; Evans *et al.*, 2008). The need for entire populations to protect themselves from the risk of assumed disease reflects a broader shift towards ‘surveillance medicine’ (Armstrong 1995). As a result, a plethora of health policy initiatives have been implemented in many countries in recent years, often as part of a broader public health enterprise towards the prevention of perceived health risks. These visions are imbued with a renewed interest in the need for populations to monitor their own bodies against perceived health risks associated with deteriorating lifestyles, such as worsening nutritional consumption.

Secondly, the means through which health discourses are articulated have become more complex, socially constructed through a public process of negotiation of values *within* popular contemporary culture. In other words, discussions about health and health promotion messages are no longer confined to medical contexts, but infiltrate popular culture, media and various cultural artefacts. To this end, medicalization is now a powerful but insidious feature of a number of ‘*bioethical* media events’ (see Miah and Rich forthcoming). Television programmes such as the UK’s Jamie Oliver’s *School Dinners* and films like Morgan Spurlock’s *Super Size Me* now populate the entertainment landscape as ‘edutainment’ (Dijck 2006) to promote certain lifestyle changes (see Evans *et al.* 2008). These media texts contribute towards diverse cultural narratives that inform our understanding of what it means to be healthy or sick and the expansion of these concepts into the psycho-social domain – where sickness can sometimes imply a moral transgression, rather than a biological dysfunction.

The third cultural shift in how health is encountered brings us to the central focus of this paper and occurs through advancements in digital technology, which have transformed the entire infrastructure and culture of medicine (see Miah and Rich 2008). This digitalization of health structures spans the mechanisms of informational management, right across to the specific medium through which medicine is consumed. Developments in the Internet, mobile devices, and other virtual technologies are now regularly used to construct health discourse, provide medical advice and treatment. This medicalized cyberspace is characterised by a process of negotiations of and around the body, whereby the investment of our identity within social software becomes inextricable from the meanings we give it. Within cyberspace, individuals negotiate new medical terrain, which emerges and changes almost on a daily basis. The implications of this are far reaching, not only for how people communicate with each other about their health, but more fundamentally in how it becomes a dominant mechanism of health knowledge production and regulation. In Nettleton’s (2004) words, there now exists an ‘e-scaped’ medicine, a new medical cosmology whereby the sites, spaces and locations of the production of knowledge are changing. In her view, the proliferation of information and communication technologies will influence the means by which knowledge and information are generated and sustained. Moreover, the capacity for cyberspace to act as a conduit through which people actively shape their bodies within and through spaces of ambiguous realness, illustrates the way surveillance medicine is operating within contested conditions of postmodernity. This, in combination with the fact that surveillance has been one of the foremost concerns that has surrounded the Internet, provides a considerable justification for considering how medical surveillance takes place online. In some sense, the medicalization of cyberspace is part of the process towards realizing Haraway’s

(1985/91) cyborg or, perhaps, Hayles (1999) posthuman, as people renegotiate the boundaries of their bodies and what it means to be human.

Discussions about medicalization have generally focused on the first two of these cultural shifts: health crises and the construction of health in the media. However, less has been written about the third category, the medicalization of cyberspace (Miah and Rich 2008). Yet, as Conrad identifies, in our contemporary culture, it is crucial to understand the 'impact of the Internet' (2005: 12) in constituting contemporary medicalization debates. Many of the current discussions around medicalization should be informed by what is taking place online, as this is a crucial context where traditional, categorical assumptions about health, identity and medicine are being contested. Digitally enabled health services and practices in cybermedicine are growing phenomena within the medical landscape, following the development of a range of services available on the Internet, including self-diagnosis information sites and online consultations with health professionals. While the features of medicalized cyberspace are varied, in this paper we explore the specific characteristics of surveillance medicine and its capacity to expand the medical gaze towards the surveillance of the lives of healthy people (Miles 1991). In doing so, we address ethical features of the rise of surveillance technologies now populating cyberspace, considering how this might inform wider discussions about medical surveillance in the emerging conditions of postmodernity, where the ontology of the body is rendered more ambiguous and complex.

Cyberspace and medicalization of the healthy

Health discourses within cyberspace are multiple, shifting and often contradictory, and cyberspace is neither a utopia nor dystopia as a mode of informing or engaging people about their health. While acknowledging the challenges it presents, cyberspace has been instrumental to the expansion of the medical sphere, regularly used by both those who are ill and seek support and information through communication and by broader populations of those who are healthy. This shift of medicine towards the everyday sphere has been recognised by Armstrong (1995) as a key feature of what has been defined as 'surveillance medicine':

This new surveillance medicine involves a fundamental remapping of the spaces of illness. Not only is the relationship between symptom, sign and illness redrawn but the very nature of illness is reconstructed (Armstrong 1995: 395).

Armstrong's concept of surveillance medicine draws attention to how health phenomena enter the cultural arena via a 'problematization of normality' (*ibid* 393) where the focus of medicine is on the healthy population rather than the ill, thus 'locating illness outside of the body'. Increasingly, this occurs via an emphasis on prevention (of disease) and minimization of risk, rather than simply the treatment of illness.

Much of what takes place in cyberspace is focused on the sort of surveillance medicine described above, wherein the emphasis on the prevention of disease and risk avoidance, incites entire populations to monitor their lifestyles. One only has to connect to the World Wide Web or open email to be exposed to advertisements about health products, medical devices or health services. These digital environments are not only imbued with health advice, but are often underpinned by a moral narrative about the broader benefits they entail. For example, Internet-based promotions for drugs such as Viagra boast of their capacity to improve not only our health but also our lifestyles (Mamo and Fishman 2001). Indeed, evidence suggests that the majority of users seeking health related information on the Internet are searching for preventative, lifestyle oriented information, rather than for the treatment of ill-health. For example, according to the Pew Internet and American Life Project Report (2006) of the 60 million Americans that have used the Internet to seek health and medical information, over 60% of these are consumers considered to be 'well' (or at least, categorised as not ill) and who are searching the Internet for preventative medicine and wellness information. In other words, online users accessing networked health information are not just ill patients looking for medical advice or health support. For example, Hardey (2001) notes that some of the most popular UK based websites (eg the BBC – British

Broadcasting Corporation and the NHS – National Health Service) that offer health advice, not only contain information about disease categories, but also encompass broader lifestyle advice associated with risk factors.

There are many, varied health issues that are articulated through surveillance discourses and we limit our discussion to concerns about weight and health. Specific conditions of this case make it a particularly rich example through which to study the kind of surveillance medicine Armstrong (1995) outlines for two key reasons. Firstly, practices related to weight and health are intimately connected to the moral panic around obesity and thus, are illustrative of how medical categories come to condition everyday lifestyle practices. Secondly, digital technologies provide precise technologies through which mass populations can access resources to engage with self-surveillance and monitoring of weight and health, as a mode of obesity prevention.

For these reasons, we examine how cyberspace has become another environment through which the governance of health behaviour takes place. We examine a proliferation of cyberspatial resources, which are utilised as technologies of self-regulation concerned with weight. These include Internet based resources, such as websites with weight monitors, calorie counters, or personal training services. We also examine the infiltration of surveillance medicine into those cyberspace designed as leisure activities, including video game consoles and Internet based virtual environments. These emerging digital tools are situated within wider discourses, which impart a moral imperative for individuals to assume responsibility for their health and to engage with a broader self-surveillance of the body. Increasing consumerism around health and weight online, coupled with the development of tools on the Internet for self-regulation of the body, are all emerging phenomena that provide an entry point into examining a broader process of medical surveillance within cyberspace.

Cyberspace as a Biopolitical Apparatus

As indicated earlier, the control of populations by means of medicalization tends not to take place via enforced action, but through the normalization of health behaviours within everyday contexts. As populations have grown and become more fluid and complex, ‘an explosion of numerous and diverse techniques for achieving the subjugations of bodies and the control of populations’ (Foucault 1978: 140) has arisen. A number of scholars (Bunton 1997; Howson 2004), have examined how health discourses enact instances of what Foucault (1978) has termed ‘biopower’ which normalises and controls certain practices of the body. Foucault (1978: 139) referred to two forms of power over ‘life’ which developed from the seventeenth century. Firstly, the ‘anatomo-politics of the human body’ focused on the efficiencies of the individual body, and the ‘disciplining of the body’. Secondly, he identified the ‘biopolitics of the population’ which concerned itself with the regulation of the ‘species body’ or ‘man-as-species’ which serves to control population levels such as life expectancy, mortality or the prevalence of disease. Foucault refers to the joining of these two forms of power, as ‘biopower’:

Biopower we suggest, entails one or more truth discourses about the ‘vital’ character of living human beings; an array of authorities considered competent to speak that truth; strategies for intervention upon collective existence in the name of life and health; and modes of subjectification, in which individuals work on themselves in the name of the individual or collective life or health (Rabinow & Rose 2006: 195).

According to Foucault, biopower is constituted through shifts towards the techniques of governance that *both* discipline and regulate social experiences. Thus, on the surface biopower works in the interest of humanity to prevent the demise of ‘man-as-species’. However, on a deeper level, it simultaneously serves other social functions, namely, to control and regulate ‘deviant’ populations. In this view, as populations have grown and become more fluid and complex, nation states have become ‘more concerned about the management of life (bio-power) and the governing of populations’ (Howson 2004: 125), particularly in relation to health, disease, sexuality, welfare and education. This process can be observed in the attempts

by governments and health organisations to regulate what is considered to be a growing epidemic of obesity in western society. Reflecting the surveillance medicine outlined above, personal and public lives are increasingly framed and regulated by an incessant outpouring of health messages relating to obesity and measures to be taken to avoid it. As Groskopf (2005: 41) points out, the World Health Organisation's 'global strategy on diet, physical activity, and health' recommends a variety of methods of control to curtail the 'obesity problem' including instruction, surveillance and evaluation'. The provision of information around healthy lifestyles draws on strong political imperatives that prescribe the morally correct choices people should make around lifestyle concerning physical activity, body regulation, dietary habits, and sedentary behaviour.

An exploration of current health resources in cyberspace suggests that digital environments provide an effective mechanism through which to enact biopower in relation to weight concerns, because it has the capacity to reach large populations, whilst at the same time offering the tools through which those populations can *self regulate*. To this end, we depart from Foucault insofar as we acknowledge the role of individual agency as an integral component of how this surveillance is shaped. In the section below, we explore how cyberspace has emerged as a context through which to expand the formal and informal medical gaze into everyday lifestyles, through forms of *discipline* and *regulation* of bodies.

Cyber self governance

According to the Pew Internet and American Life Project Report (2006) of the 113 million American searching for health information on the Internet, 44 per cent of these have searched for info on exercise or fitness and 49 per cent for info on diet, nutrition, vitamins or nutritional supplements. In recognising the tendency for the public to use the Internet for these purposes, agencies and organisations have utilised cyberspace as a kind of socio-technology through which to encourage people to engage with healthy behaviours and monitor their lifestyle as a *preventative* mechanism. Today, there is a growing number of Internet based intervention programmes and technologies geared towards changing health behaviours (see Cummins *et al.* 2003: 55). A proliferation of Internet based technologies deliver online mechanisms that allow the public to monitor and regulate their bodies in relation to an ever-increasing range of lifestyle factors.

Firstly, there are resources that encourage self-assessment and self-surveillance of one's condition. Weight charts, calorie calculators, target heart rate calculators online now enable users to undertake their own health screening in order to monitor their bodies in relation to risks associated with obesity. Websites associated with physical activity behaviours for example, typically provide Body Mass Index (BMI)¹ and exercise level counters as methods of assessment (see Evers *et al.* 2003: 66). These are not just provided by commercial companies, but are also generated by health promotion agencies and other institutions. There are too many to list, but as an example, IntelliHealth (<http://www.intelihealth.com>) hosted by Harvard Medical School, provides consumer health information on risk assessments, calculators, and online advisors and guides. Similarly, the Mayo Clinic (<http://www.mayoclinic.com>) has a 'healthy lifestyle planner', providing a range of 'calculator tools' including BMI calculators for children and self-assessment tools including a personal health scorecard. These online BMI calculators allow users to enter their height and weight detail, from which a weight and health category indicator is given. In these contexts, health risks are presented in a calculable form, which has the effect of constructing the body as

¹ Body Mass Index is a tool used to measure and determine levels of obesity. A BMI score is calculated by weight in kilograms divided by height in meters squared (World Health Organisation 1998). The index score is then used to determine an individual's weight (and health) category against the highly questionable concept of 'ideal weight', 'the idea that weight associated with optimum health and longevity could be determined by height' (Seid 1994: 7). Burry (1999) suggests that BMI 'norm' has become the 'golden mean' for distinguishing between those who are an 'acceptable/ideal weight' (BMI 20-25) and those who are overweight (BMI 25+) or obese (BMI 30+). BMI is now widely acknowledged to be imprecise, for example, it overestimates fatness in people who are muscular or athletic, it is not a good index for children and adolescents, takes no account of age, sex or ethnicity, nor does it measure how much fat an individual (see Evans *et al.* 2003; Monaghan 2005). Despite this, it continues to be widely accepted and used as a measuring device because it is far easier to measure 'weight' than to measure 'fat', so BMI can be calculated quickly by the lay public, without expensive equipment.

knowable and measurable. For example, BMI calculators prompt users to enter numerical data which is then transformed into a social and biomedical category, such as overweight or obese.

Secondly, having diagnosed and assessed their state of health, there is also a range of online services that assist individuals in using diagnosis and assessment to *monitor* and *change* their bodies, habits and lifestyles. As part of this project, the expanding and ubiquitous presence of networked health information provides a rich context for companies and agencies to promote services related to healthy lifestyles. As Pitts (2004: 36) observes, health continues to be a big business in cyberspace, with ‘companies like AOL, Yahoo and CompuServe’ running ‘popular women’s health sites that are saturated with advertising’. More intrusive forms of health promotion and commercialisation take place regularly via email spamming, which advertises health related products. There is a growing number of commercial based Internet sites trading on the discourse that an individual should regulate their body, weight and lifestyle to insure against weight related disease and ill-health. This provides a vigilant corpus of surveillance tools through to which evaluate the state of ones health on a *daily basis*. A range of services and products to enhance a healthy lifestyle, including personal training (eg www.workoutsforyou.com) or weight loss programmes (eg www.weightwatchers.com, www.fitday.com). For example, FitDay (www.fitday.com) is an online diet and weight loss journal, which provides an account to ‘enter your daily foods and exercise. FitDay analyzes all your information and shows you daily calorie counts, carbs fat and protein, weight loss goals, long term diet analysis and much more’. Personal fitness training services are also provided in digital environments, where users complete health profiles and health history questionnaires and various assessments online, after which a personal training instructor customizes a programme for the client. In these virtual environments, the client is often then responsible for completing the training and reporting back to the trainer online. Reporting on adherence in this way encourages users to gather health information and act on that information via health related behaviours. In these cyberspaces, users are therefore attributed with responsibility to:

... ceaselessly maintain and improve her or his own health by using a whole range of measures. To do this she or he is increasingly expected to take note of and act upon the recommendations of a whole range of ‘experts’ and ‘advisors’ located in a range of diffuse institutional and cultural sites (Bunton and Burrows 1995: 208).

Collectively, these various digital tools expand the surveillance and disciplinary power (Foucault 1977) of the medical gaze, whilst offering distinct ways through which people come to read and know their bodies. Resources such as BMI calculators reflect a particular ontology of the body as a authentic and truthful revealing. As Ball (2005: 90-91) observes ‘The body itself has emerged as a legitimate surveillance target because of the immense level of detail and ‘truth’ *about the person* it is thought to provide’ (our emphasis). Through such interfaces, one not only receives a neutral biomedical classification of their body, or weight, but may also experience one’s body through moral discourse, whereby ‘fat is interpreted as an outward sign of neglect of one’s corporeal self; a condition considered as shameful, dirty or irresponsibly ill, in effect, reproducing and institutionalising moral beliefs about the body and citizens’ (Evans, Rich, Davies and Allwood 2008: 38). Many of these health resources are littered with moral and medical overtones prescribing the correct ‘choices’ one might make to adapt their lifestyles in relation to weight loss, physical activity, dietary habits etc. In this sense, surveillance does not occur through some authoritative expert ‘watching over’ the individual, nor are online users forced to act or behave in certain ways. Instead, medicalized cyberspace reflects an increasing imperative towards self-surveillance of one’s health and body as a preventive measure and moral obligation. These digital health resources blend disciplinary measures underpinned by a moral imperative, whereby individuals are being ‘facilitated’ to understand ‘what is good for them’ (see Burrows and Wright 2007). Indeed, many of the associated resources are promoted on the basis of enabling users to ‘insure against disease and illness’ (Nettleton 1997: 213), including such conditions as obesity.

The healthy cyber citizen is expected to utilise these new technologies to remain ‘fully informed’ (Kivits 2004: 524) about current health knowledge. The promotion of these digital resources reflects the

occupation of cyberspace by discourses associated with New Right ideology, asserting particular visions of personal agency associated with responsibility and rationality (Nettleton 1997: 213–214). As Hendersen and Petersen (2002: 3) suggest, patients are thus positioned as consumers and are ‘expected to be independent, active and informed rational decision makers’. The expansion of surveillance medicine is, as noted above, most strongly reflected in the fact that the majority of users seeking health related information are ‘healthy’ individuals searching for preventative, lifestyle-oriented information (see Pew Internet and American Life Project Report 2006; Kivits 2004). Kivits (2004: 520) states that the search for relevant information to reduce ‘health risk’ appears to be ‘a general imperative for contemporary individuals in an information environment’ and ‘finds a sociological echo in the concepts of reflexivity and the reflexive nature of social life’ (*ibid*: 513). This notion of self-cultivation draws upon liberal humanist ideas around the possibilities for the individual to be in ‘control over his or her destiny’ (Nettleton 1997: 208) and to have the capacity for ‘self-control, responsibility, rationality and enterprise’ (*ibid*: 214). To this end, it involves a moral imperative that may ignore the social contexts of health:

A consumerist ethics demystifies the social determinants of choice by focusing on the ideal of individual ‘freedom’ of choice; it privileges the unidirectional transmission of (ostensibly) value-neutral biomedical information above other ways of knowing and communicating (Spoel 2006: 197).

Health related measurements, assessments and diagnoses that were previously conducted by medics/health professionals, are therefore, increasingly being undertaken by the lay public through this proliferation of information and tools. Thus, self-diagnosis does not rest upon the consultation of experts, but may now involve a process of searching and gathering a diverse range of information sources online, and perhaps making decisions independent of some medical authority. Therefore, some concerns have arisen about the regulation of medical knowledge within cyberspace. As Henson (1999: 373) notes, the proliferation of health related information now available online could lead ‘to greater prominence given to misleading or incorrect information by assuming that all sites are equal, by searching for only one or two sites at random or by searching for what they [patients] hope to be true’. However, this reliability discourse on cyberspace reveals how the Internet is framed by an unqualified presumption of a knowledge hierarchy. Moreover, it neglects to consider how online users are often quite sophisticated in their ability to negotiate various types of spaces, using multiple sites rather than just one source to inform their perspective. Similarly, for information pages like Wikipedia, the legitimacy of any single entry is conveyed by the background history and discussion content, which users can access to help decide how best to treat the information.

Regulating populations

The biopolitical co-opting of these technologies as mechanisms through which to regulate mortality, disease and other biological aspect of ‘man-as-species’ occurs in a number of key ways in cyberspace. Firstly, with its capacity to reach a vast number of people quickly and easily, cyberspace assists in the expansion of the ‘medical eye over all the population’ (Armstrong 1995: 400). Subsequently, much speculation continues about the Internet’s future capacity to promote surveillance medicine. As Cummins *et al.* (2003: 56) observes, in the future, a ‘virtual health care system will consist of the *Preventive Web* that will provide information on healthy living and the *Chronic Care Web* that will offer disease management services (COR Healthcare Resources 2001)’. Indeed a number of agencies are already starting to build these virtual systems. For instance, the American Heart Association and the Mayo Clinic are investing considerable resources into developing and marketing Internet-based programs for health promotion and disease management. In the USA, the National Health Promotion and Disease Prevention agenda ‘Health People 2010’ explicitly notes the potential for Internet programs to target populations, and has included this as a goal in their agenda (Cummins *et al.* 2003). A specific objective is to increase the proportion of households with access to the Internet, ‘recognising the impact that such media may have as a vehicle for health promotion’. As such, the potential for cyberspace to reach large numbers of people lends itself to the regulative feature of biopower, which endeavours to control the health of entire

populations. A further example is the recently launched – USA only – Google Health, which promises to allow users the chance to keep a permanent record of their medical records. By linking with clinics, this opportunity should, nevertheless, be situated in concerns about the monopoly of Google over online searching. Its attempt to provide online tools that rival Microsoft's Office, along with a whole host of technologies that do not make explicit the possibility to opt out of – such as automatically tracking and storing web browsing history – provides a double edge to this opportunity to empower ourselves through the technology.

Secondly, the ontological significance of one's weight is further complicated by the emerging tendency within cyberspace to provide national and international statistics of BMI, targeted at both adults and children. Tables detailing the average BMI of nations now typically accompany health promotion websites or online news, encouraging adults to take better care of their diets and physical activity. For example, the BBC (2006) news website reported that the "Average European 'is overweight'" featuring a table of 'Europe's heavyweights' based on average BMI. The use of such digital tools has been integral to the development of online resources that target childhood obesity and are frequently used to validate the need for early childhood intervention around physical activity and diet. For example, the 'Get Kids Active' campaign website, (www.getkidsactive.com) describes itself as a 'New Zealand based initiative which aims to help provide parents, teachers and caregivers with advice, resources and downloads about getting children physically active in an increasingly inactive world'. An online counter to monitor childhood obesity across the globe *on a daily basis* is integrated within this website. By providing this information within a digital environment, changes to the numbers of 'obese' children are captured instantaneously. In these digital environments, each individual child's BMI is, therefore, seen to carry importance, since it has the potential to alter the daily figures. The production of BMI tables in this way impacts upon 'the relationship between individuals, populations and geographic spaces' (Halse 2007, no page given). The moral obligation imposed upon the individual by this coercive technology can become much more powerful and can lead to stronger relationship between nations, populations and ones individual weight category. Moreover, the use of tables comparing the BMI of different nations on a daily basis, operates to 'deploy a homogenising logic of sameness – a common BMI 'norm' (Halse 2007). As Halse (2007) asserts, in these contexts, the constitutive effects of surveillance medicine expands in the sense that 'personal responsibility for ensuring that one's weight is within the prudential BMI (body mass index) 'norm' is constituted as care for one's self *and* a social and ethical duty to others in society' (*ibid*).

The combination of this capacity to reach vast numbers, along with the ontological and moral significance of fat, has allowed digital resources to become useful biopolitical tools through which to shape populations. As such, online tables and health resources have already been used for 'schooling healthy children' (Burrows and Wright 2007; Wright and Dean 2007; Evans *et al.* 2008). As Liberman (1997) outlines, principles of health promotion and interactive media learning have been integrated into the design of health education video games for children and adolescents. These video games are designed to enhance several intervening, or mediating, behavioral factors that make a significant contribution to improving health status. Liberman (1997: 103) suggests that 'video games oriented to health promotion...can help players learn about prevention and self-care and improve their health-related skills and behaviours'. As Burrows and Wright (2007) observe, within many of the website resources linked to school programmes, images of 'greasy, oily food *and* people encourage children to be disgusted by fat and pathologically fearful of it'. Health promoting websites such as www.healthpromotingschools.org.uk are common resources for schools, providing interactive web tools and games through which to prescribe lifestyle practices. They provide activities through which young people can learn what constitutes healthy behaviour. Students enter into an 'artificialisation of culture' (Kosna 2008) as they encounter a virtual school environment and take part in interactive activities at 'hotspots' located around the school. For example, in the cafeteria, children can play games and word search puzzles to learn about diet: 'everyone should eat five portions of fruit and vegetables a day to help keep healthy. Can you find the fruit and vegetables hidden in the word search.'

Figure 1: Health promoting schools website:

Cyberspace also functions as a conduit through which to accord parents the responsibility to monitor their children. In England and Wales in November 2007, the Government introduced the Health and Social Care Bill, which made legislative changes to the National Child Measurement Programme. Established in 2005, the NCMP weighs and measures children in Reception Year (aged 4-5 years) and Year 6 (aged 10-11 years). As part of this scheme, in 2007 the government considered plans to advise parents of a child's weighing result, and to direct parents to a Web site to conduct online BMI test to monitor their child's weight. Some of the British press reported a Department of Health spokeswoman as commenting 'We want to ensure that parents are aware of the options available to them so that they can take responsibility for choosing the most suitable ways to support their child in achieving a healthy weight' (Telegraph 2007). Therefore, online resources produce both 'population strategies' and 'individualising focuses' (Bunton 1997: 229), by promoting the mass surveillance of children, but placing the responsibility for this on parents or guardians.

Virtual Morality and Prosthetic surveillance

Digital resources such as those described above are not only integrated into formal health education, but have expanded into every day culture. Most notably, the convergence of health discourse with digital consumer culture has resulted in the infiltration of the medical gaze into private leisure spaces. Increasingly, health promotion messages concerned with targeting obesity feature in consumer products. Bunton (1997: 235) observes that a growth in health-related goods and services is influenced by market logic, which produces both new products and health-conscious consumers. The convergence of consumer market logic with health discourses is a feature of new cultural artefacts in cyberspace, which reach into and regulate cultures and contexts previously untouched by medical discourse. In what follows below, we explore how this process has led to a new form of medical surveillance, which we refer to as *prosthetic surveillance*.

The recent development of the Nintendo *Wii Fit* indicates how cyberspace has been utilized to appropriate cultural spaces for the purpose of surveillance medicine. The Nintendo Wii is a games console that can detect movements of the player via wireless controllers. It promises a new form of social activity, new sports or games that can, perhaps, play a new role in enhancing levels of physical activity and movement, designed to mimic the real life movements of those activities. However, the design expectation that users replicate the moves of actual sports is often subverted by advanced users who can trick the machine into believing, say, an entire arm swing has taken place, with merely a flick of the wrist. A recent development for this console is *wii fit* which offers an integrated balance board peripheral device that weighs the user, gauges fitness and balance and monitors BMI. Players are then offered training programmes designed to improve their results. This games console thus gives a BMI measurement offering categories such as underweight and fat (see Figure 2).

Charting Progress

Check your daily progress in Wii Fit with easy-to-understand charts and graphs. The orange line you see in the center of the graph represents your BMI the first time you checked it. From then on, it's easy to tell how you've done since you started using Wii Fit. You can also set goals, check your Wii Fit Age, and even enter exercise time you've done outside of Wii Fit.

Figure 2: BMI calculation on Nintendo wii, taken from Nintendo website http://www.nintendo.com/wiifit/launch/#/what_is_wii_fit/progress_chart

Such cyberspaces become new cultural artefacts and provide the means through which to regulate home and leisure activities of large numbers of individuals, which were previously inaccessible to traditional medical discourses. Video gaming remains a significant feature of children's cultural milieu (Fromme 2003; Turkle 1984), and was previously a space where young people were free of traditional regulatory discourses. In this sense, the medicalization of cyberspace expands surveillance medicine into spaces that were previously, in the main, unoccupied by these discourses.

It is pertinent to consider the questions this raises about the materiality of the body and the redundancy of the ontological division between physical bodies and virtual worlds. Indeed, the emergence of cyberspatial medical surveillance must be seen in the context of broader discussions concerning the embodied forms of subjectivity within cyberspace. Cultural artefacts that employ some form of 'artificialisation of culture' (Konsa 2008) - such as the gaming worlds of *wii* - (re)present familiar discourses, spaces and locations of the real world within a virtual format. Early studies of cyberspace heralded virtual contexts as spaces where body markers were absent and, thus, which could be without the worries of being judged by these visible characteristics. Yet, various instances of 'prescribing practices' (Burrows and Wright 2007) of the body, such as those outlined above, reveal a more complicated ontology of the body. Thus, despite its designation as virtual being *not real*, these spaces do not obscure the body. Environments such as *wii fit* virtualize one's identity, leading to a prostheticisation of the body within cyberspace. In the case of *wii fit*, players interact via a graphical, onscreen avatar, rather than through a direct camera image of themselves.

Weight monitoring tools, nutrition games, and virtual environments such as Nintendo *wii fit*, provide a means through which to regulate these prosthetic bodies. Thus, this form of surveillance medicine, not only regulates physical selves in real time, but via *prosthetic surveillance* regulates and defines bodies that are *simultaneously* hyper text and flesh. Individuals enter as their self, their body, and their avatar. This brings together both new and old burdens, whereby for example the regulatory mechanisms within environments such as *wii fit*, bring corporeal measurements of BMI, fitness, etc into virtual settings as a prostheses of physical selves. As Braidotti (2002: 227) notes 'today's body is immersed in a set of technologically mediated practices of prosthetic extension'.

Consequently, surveillance medicine, now reaches into and regulates prosthetic bodies, such as those that operate within gaming environments or 'artificial cultures' (Konsa 2007). This becomes even more intriguing and complex as such entities as the online game environment *Second Life* (www.secondlife.com) emerge. Second life is a 3D virtual world platform, where users socialise, connect and interact with other players in real time. Such virtual worlds are now utilised as spaces through which

to locate health projects and real life medics. For example, in May 2008, The Second Life health portal was set up by the Spanish Society for Family and Community Medicine (FYC) and the Coalition for Citizens with Chronic Illnesses. This portal provides a means for people to enter a virtual consulting room and talk with a real doctor who is also logged into the virtual environment. Interactive games are also a feature of health regulation in *Second Life*. For example, the Ohio University Sim in Second Life offers a 'nutrition game' to learn about the impact of fast food culture on health. Players can adopt different diets in virtual fast food restaurants, resulting in different points scored in accordance with 'healthy choices' (see Boulos *et al.* 2007).

Far from being absent in cyberspace, surfaces of the body are inscribed with medicalised meaning and moral value. Bodies take on a presence as a 'post-human manifestation' (Kennedy 2000: 15), constituted through new modes of subjectivity (Stryker 2000). As such, contrary to theories that claim the body may disappear into text within cyberspace, these various cultural artefacts offer particular ways of *knowing* the body through surveillance medicine. Recent reactions from users of these socio-technologies speak to how the ontology and boundaries of corporeality are thrown into critical relief through cybermedicalization. One recent case concerning *Wii Fit* indicates how far reaching the effects of cybermedicalization might be. In May 2008, British media (see the *Daily Mail*) published concerns raised by parents who children were labelled fat by *Wii Fit*, the step-father of a ten year old girl commented: 'She is a perfectly healthy, 4ft 9in tall 10-year-old who swims, dances and weighs only six stone'. Nintendo later released an official apology:

Nintendo would like to apologise to any customers offended by the in-game terminology used to classify a player's current BMI status, as part of the BMI measurement system integrated into *Wii Fit*. *Wii Fit* is still capable of measuring the BMI for people aged between two and 20 but the resulting figures may not be entirely accurate for younger age groups due to varying levels of development (Daily Mail 2008).

Cases such as this reveal how new, digital health technologies offers surveillance over a projected virtual subject or avatar, but ascribe social value and moral virtue to features of users' corporeality. This raises a number of ethical questions about the legitimate boundaries and extension of surveillance medicine in cyberspace. However, this is not to position individuals or indeed prosthetic bodies, as cultural dupes or objects of disciplinary power, who have no capacity to resist (see Hartsock 1990: 171).² Indeed, according to Foucault (1980: 142) 'there are no relations of power without resistances; the latter are all the more real and effective because they are formed right at the point where relations of power are exercised' (Foucault 1980: 142). The case where the father of the girl labelled fat by *Wii Fit* protested, thus forcing an apology from Nintendo, reveals an instance where resistance might be formed at the intersection between 'real' bodies, processes of prostheticisation, and the technologies undertaking surveillance of the body. In other words, there is no central dominance of surveillance taking place, but a complex interplay between attempts to codify and attempt to 'fix' the body and subjectivity in particular ways, to and the various ways in which individuals may experience this. In the case above, efforts towards the resignification of the category of 'fat' are important, since:

The questioning of the extent to which the body can be pinpointed as a source of truth, because it is constantly reconstituted and inherently unstable, is the starting point for challenging biotechnologies that specifically locate the body as a site of ultimate truth or authenticity about the person (Ball 2005: 101).

Our point is that it is important to note that socio-medical relations that take place as a result of cyber surveillance are inherently complex, and individuals may engage in various ways with dominant health discourse pervading cyberspace. On this view, various researchers now recognize that we need a much

² See Hartsock (1990) for further discussion on the concerns with Foucault's notion of power and its relationship with resistance.

more sophisticated understanding of how Internet users utilize online health information. For example, Nettleton *et al.* (2004: 537) observe that there is a great deal of variability in the 'reflexive engagement' patients have with material accessed within cyberspace.

There is not space here to expand further on these various forms of engagement. Rather, our point is that these cases reflect the category of posthuman spectacle, where the medical gaze is now present within a social and cultural sphere in which it is not yet qualified to treat. The result is a series of constitutive effects upon the appropriation of the prosthetic body, whereby the physical and virtual are enmeshed and there is a continual engagement with body matters as both of and on the body, and through a prostheticised body. Medicalized cyberspaces might then be characterized by the notion of becoming; they involve a process of negotiation on body and health issues where 'online bodies are bodies that are certainly being written, but simultaneously bodies to write on' (Sundén 2001: 229). The medical surveillance of *prosthetic bodies* reflect Kroker and Weinstein's (1994) articulation as:

Not really the wired body of sci-fi with its mutant designer look, or body flesh with its ghostly reminders of nineteenth century philosophy, but the hyper-texted body as both: a wired nervous system embedded in living (dedicated) flesh (Kroker and Weinstein 1994, online).

This is not to suggest that all forms of body surveillance are bad, or have negative implications. Rather, our point is that cyberspace has extended the means through which moral narratives concerning the self-surveillance of the body, can be articulated. In doing so, these contexts may invoke a particular ontology of the body as materiality and flesh, but also as a prosthetic that represents itself in some fixed capacity within cyberspaces. In other words, technologies such as those outlined above, may draw upon 'practices that hold the body to be a source of 'truth' or 'authenticity' (Ball 2005: 90) as if revealing something about the individual. Prosthetic bodies are now subject to the sort of moral narratives of surveillance medicine, which have traditionally permeated physical environments. The imperative towards healthy norms pervading a medicalised cyberspace are underpinned by a new, right ideology asserting particular versions of personal agency (see Nettleton 1997: 213). The assemblage of self-assessment and self-monitoring imperatives shapes our sense of responsibility to lead a particular life, as if it were 'at once the duty of each and the objective of all' (Foucault 1984). This form of neo-liberalism calls upon 'the individual to enter into the process of self-examination, self-care and self-improvement' (Petersen 1996: 48–49). This imperative is enhanced by the infiltration of surveillance medicine into non medical areas of social experience, such as video gaming or virtual social networking worlds. This permeation enhances the dovetailing of health discourses with digital consumer discourse, such that individuals are positioned as 'consumers', deemed responsible for their own bodies, health and living particular lifestyles. Concomitantly, many commercial companies promote health resources on the premise of personal empowerment and liberal individualism. For example, Fitwatch.com, is an online tracking services which promotes itself on this very basis, with its slogan 'get the data, get the knowledge, get fit'. Its marketing material draws upon a language heavily inflected by liberal individualism:

Imagine that you had the opportunity to use a tool which you only needed to use a few minutes a day, yet it would *give you the power and knowledge to help you lose weight and get fit*, would you use it or would you just walk on by and ignore the chance to take control of your life? (our emphasis)

This rhetoric of empowering and enabling 'effectively constructs the individual subject as a 'health consumer' in accordance with the model of consumer capitalism' (Grace 1991: 329). Marketing of *Wii fit* for example, enmeshes family leisure, as consumption, with discourses of empowering health:

By playing *Wii Fit* a little every day, you, your friends, and your family can work towards personal goals of better health and fitness (<http://www.nintendo.com/wiifit/>).

It is important to note that cyberspace has brought about a vast variety of health material and resources that exist outside of the communicative realm of official health care systems or medical institutions. However, the presence of commercial and health promoting discourses within cyberspace operate as 'part of the larger neo-liberal, consumerist discourse and ideology of health care within which this principle typically operates' (Spoel 2006: 198). In this new cybermedical order, 'that which parades as choice is often a narrowing of choice' (White 1995: 36).

Conclusion

In this article we have outlined how cyberspace contributes to the reinforcement and extension of the 'continuum between health, illness and disease' (Armstrong 1995). Whilst the expansion towards the surveillance of the everyday is a ubiquitous feature of medicalization, the cases we consider suggest that there is something distinct about cyberspace within this process. It presents both new and old bodily burdens that connect with various expectations of medical surveillance. This infiltration of health promotion within new digital environments of cyberspace reflects Haraway's (1991) observation that biomedical discourses have been 'progressively organized around a very different set of technologies and practices, which have destabilized the symbolic privilege of the hierarchical, localized, organic body' (1991: 211). In the cases outlined above, cyberspace provides a means through which to articulate and extend 'surveillance medicine' (Armstrong 1995) and, in doing so, enacts what we refer to as prosthetic surveillance. This form of surveillance draws on a particular ontology of the body, which codes, reads and labels materiality and flesh, alongside prosthetic bodies. Biopower can be operationalised on physical bodies, but also on and through prosthetic bodies, which capture blurred spaces of the virtual and physical. These discourses and forms of regulation challenge our conception of the boundaries of corporeal bodies, complicating the relationship between virtualization and corporeality.

There are many other aspects of medicalized cyberspace that may yield important insights for the medical profession or which offer benefits to patients and users. In this paper, we have focused on only one aspect of medicalization of cyberspace, to demonstrate its capacity towards the surveillance of the seemingly healthy, rather than those who might be considered ill. Cyberspace is now a central feature of the 'fundamental remapping of the spaces of illness' (Armstrong 1995: 395) and an imaginative series of possibilities and experiences are being enabled by an arrangement of technologies and cybertools, partly arise out of the inadequacy of previous mechanisms of health promotion to both reach large numbers of people, and provide the means through which they might engage in self-surveillance.

Advances in information technology, such as these, expand and impact upon the nature of surveillance, although they do not signal the 'redundancy of previous modes of discipline and control' (Ajana 2005). Whilst not all forms of body surveillance will have negative implications, an examination of the practices and tools for self-regulating ones body which exist in cyberspace highlights a number of ethical concerns about moral discourses of health and control. Perhaps most notably, our cursory analysis highlights the need for further work on the implications of these technologies in terms of what individuals might do with the varied information of the body that is produced through their engagement with these resources. These are particularly pertinent ethical issues given that surveillance medicine now targets increasingly younger audiences through its occupation in leisure environments such as games consoles and Internet spaces. This is not to suggest that all health or regulative discourse is negative. Rather, our concern is that the propensity towards encouraging people to monitor and measure their bodies, without guidance on what this information might mean, or indeed without due consideration of how it is emotionally, psychologically and socially experienced, may have unforeseen consequences.

References

- Ajana, B. 2005. Surveillance and Biopolitics. *Electronic Journal of Sociology*, 7.
- Armstrong, D. 1995. The rise of Surveillance Medicine. *Sociology of Health and Illness*, 17: 393-404.
- Ball, K. 2005. Organization, Surveillance and the Body: Towards a Politics of Resistance. *Organization*, 12(1), 89-108
- Ballard, K. and Elston, M. 2005. Medicalisation: A Multi-dimensional Concept. *Social Theory and Health*, (3): 228-41.

- BBC 2006. 'Average European is Overweight', Available: <http://news.bbc.co.uk/1/hi/health/6148456.stm> [last accessed 18 September 2008].
- Boulos, M., Kamel, N. Hetherington, L., Wheeler, S. 2007. Second Life: an overview of the potential of 3-D virtual worlds in medical and health education. *Health Information and Libraries Journal*, 24, 233-245
- Braidotti, R. 2002. *Metamorphoses: Towards a Materialist Theory of Becoming*. Cambridge: Polity Press.
- Bunton, R. 1997. Popular Health, Advance Liberalism and Good Housekeeping. In A. Petersen and R. Bunton (eds) *Foucault, Health and Medicine*. New York: Routledge, 223- 248.
- Bunton, R. and Burrows, R. 1995. Consumption and Health in the 'Epidemiological' Clinic of Late Modern Medicine. In R. Bunton, S. Nettleton and R. Burrows (eds) *The Sociology of Health Promotion*. London: Routledge.
- Burrows, L. and Wright, J. 2007. Prescribing practices: shaping healthy children in schools. *International Journal of Children's Rights*, 15, 1-16
- Conrad, P. 1992. Medicalization and Social Control. *Annual Review of Sociology*, 18: 209-232.
- Conrad, P. 2005. The Shifting Engines of Medicalization. *Journal of Health and Social Behavior*, 46: 3-14.
- Cummins, C. O., Prochaska, J. O., Driskell, M. M., Kerry, E. E., Wright, J. A., Prochaska, J. M. and Velicer, W. F. 2003. Development of review criteria to evaluate health behavior change websites. *Journal of Health Psychology*, 8(1): 55-62.
- Daily Mail 2008. Obesity expert condemns Nintendo's Wii 'Fit' game after it tells 10 year old girl she's fat. *Daily Mail online*, 16th May 2008 [accessed 19th May 2008].
- Dijck, J. van. 2006. Picturizing Science: The Science Documentary as Multimedia Spectacle. *International Journal of Cultural Studies*, 9(1): 5-24.
- Evans, J., Rich, E., Davies, B., and Allwood, R. 2008. *Education, Disordered eating and Obesity Discourse: Fat Fabrications*. Routledge. London and New York.
- Evers, K.E., Prochaska, J.M., Prochaska, J.O., Driskell, M., Cummins, C.O. and Velicer, W.F. 2003. Strengths and Weaknesses of Health Behavior Change Programs on the Internet. *Journal of Health Psychology*, 8: 63-70.
- Fitzpatrick, M. 2001. *The Tyranny of Health: Doctors and the Regulation of Lifestyle*. London: Routledge.
- Foucault, M. 1977. *Discipline and Punish: The Birth of the Prison*. Tr. by Alan Sheridan. New York: Pantheon Books.
- Foucault, M. 1978. *The History of Sexuality*, vol.1, *An Introduction*. London: Allen Lane.
- Foucault, M. 1980. 'Body/Power' and 'Truth and Power' in C. Gordon (ed.) *Michel Foucault: Power/Knowledge*, U.K: Harvester,
- Foucault, M. 1984. The Politics of Health in the Eighteenth Century. In P. Rabinow (ed.) *The Foucault Reader*. New York: Pantheon Books. pp. 76-100.
- Fromme, J. 2003. Computer Games as a Part of Children's Culture. *Game Studies*, 3(1), <http://www.gamestudies.org/0301/fromme/> [last accessed 18 September 2008].
- Furedi, F. 2005. *Politics of Fear: Beyond Left and Right*. London: Continuum.
- Gard, M. and Wright, J. 2005. *The Obesity Epidemic: Science, Morality and Ideology*. London: Routledge.
- Grace, V. M. 1991. The Marketing of Empowerment and the Construction of the Health Consumer: A Critique of Health Promotion. *International Journal Health Services*, 21(2): 329-343.
- Groskopf, B. 2005. The Failure of Bio-power: Interrogating the 'Obesity Crisis'. *Journal for the Arts, Sciences and Technology*, 3: 41-47.
- Hardey, M. 2001. 'E-Health': The Internet and the Transformation of Patients into Consumers and Producers of Health Knowledge. *Information, Communication and Society*, 4: 388-405.
- Haraway, D. 1985/1991. A Cyborg Manifesto: Science, Technology, and Socialist- Feminism in the Late Twentieth Century. *Simians, Cyborgs and Women: The Reinvention of Nature*. New York: Routledge.
- Hayles, N.K. 1999. *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*. London: University of Chicago Press.
- Halse, C. 2007. The Bio-citizen: Virtue Discourses, BMI and Responsible Citizenship. Paper presented at the Bio-pedagogies Conference, University of Wollongong, 25-27 January.
- Hartsock, N. 1990. Foucault on power: a theory for women? In L. Nicholson (ed.), *Feminism/Postmodernism*. London & NY: Routledge, pp. 157-175.
- Hekman, S. (ed.) 1996. *Feminist Interpretations of Michel Foucault*, Pennsylvania: Pennsylvania University Press.
- Henderson, S. and Petersen, A. (eds) 2000. *Consuming Health: The Commodification of Health Care*. London: Routledge.
- Henson, D. E. 1999. Cancer and the Internet. *Cancer*, 86: 373-374.
- Howson, A. 2004. *The Body in Society*. Cambridge: Polity Press
- Illich, I. 1975. *Limits to Medicine*. London: Marion Boyars.
- Kennedy, B. 2000. Cyberbodies: Introduction. In D. Bell and B. Kennedy (eds) *The Cybercultures Reader*. London: Routledge, 471-476.
- Kivits, J. 2004. Researching the 'Informed Patient'. *Information, Communication and Society*, 7: 510-530.
- Komesaroff, P. 1995. From Bioethics to Microethics: Ethical Debate and Clinical Medicine. In P. Komesaroff (ed.) *Troubled Bodies: Critical Perspectives on Postmodernism, Medical Ethics and the Body*. Durham, NC: Duke University Press, 62-86.
- Konsa, K. 2008. Artificialisation of culture: Challenges to and from posthumanism. *Journalism of Evolution and Technology*, 17(1): 23-35, <http://jetpress.org/volume16/konsa.html> (last accessed 24 November 2007).
- Kroker, A. and Weinstein, M. 1994. The Hyper-Texted Body, or Nietzsche Gets a Modem. *CTHEORY*. Online a: <http://www.ctheory.com/e-hyper-texted.html> (last accessed 24 November 2007).

- Lieberman, D.A. 1997. Interactive video games for health promotion: Effects on knowledge, self-efficacy, social support, and health. Chapter in R.L. Street, W.R. Gold, & T. Manning (Eds.), *Health promotion and interactive technology: Theoretical applications and future directions*. Mahwah, NJ: Lawrence Erlbaum Associates, 103-120.
- Mamo, L. and Fishman, J. R. 2001. Potency in All the Right Places: Viagra as a Technology of the Gendered Body. *Body and Society*, 7(4): 13-35.
- Metzl, J. M. and Herzig, R. M. 2007. Medicalization in the 21st Century: Introduction. *The Lancet*, 369: 697–698.
- Miah, A., and Rich, E. 2008. *The Medicalization of Cyberspace*. Oxon & New York: Routledge.
- Miah, A. & Rich, E. forthcoming. Bioethics Through the Media: Representations of Health, Illness and the Body. In: D. Albertazzi & P. Cobley (eds) *The Media: An Introduction* (Third Edition). Harlow: Pearson.
- Miles, A. 1991. *Women, Health and Medicine*. Milton Keynes, UK: Open University Press.
- Nettleton, S. 2004. The Emergence of e-Scaped Medicine. *Sociology*, 38: 661-679.
- Nettleton, S. 1997. Governing the Risky Self: How to Become Healthy, Wealthy and Wise. In A. Petersen and R. Bunton (eds), *Foucault, Health and Medicine*. London: Routledge, 207-222.
- Pew Internet & American Life Project. 2006. The Online Health Care Revolution: How The Web Helps Americans Take Better Care Of Themselves, Summary Of Findings: The Internet's Powerful Influence On 'Health Seekers'. 26 November 2006, <http://www.Pewinternet.Org/Reports/Toc.Asp?Report=26>
- Pitts, V. 2004. Illness and Internet Empowerment: Writing and Reading Breast Cancer in Cyberspace. *Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine*, 8: 33–59.
- Rabinow, P. and Rose, N. 2006. Biopower Today. *Biosocieties*, 1: 195–217
- Rose, N. 2007. Beyond Medicalization. *The Lancet*, 369: 700–701.
- Spoel, P. 2006. Midwifery, Consumerism, and the Ethics of Informed Choice. In P. L. Twohig and V. Kalitzkus (eds) *Bordering Biomedicine: Interdisciplinary Perspectives on Health, Illness, and Disease*. Amsterdam: Rodopi Publications, 197-214.
- Sundén, J. 2001. What Happened to Difference in Cyberspace? The (Re)Turn of the She- Cyborg. *Feminist Media Studies*, 1: 215-232.
- Stryker, S. 2000. Transsexuality: The Postmodern Body and/as Technology. In D. Bell and B. M. Kennedy (eds) *The Cybercultures Reader*. London: Routledge, 588–597.
- Telegraph 2007. <http://www.telegraph.co.uk/news/uknews/1569630/Obesity-checks-for-all-primary-school-pupils.html>, [last accessed 17 November 2007].
- Turkle, S. 1984. *The Second Self: Computers and the Human Spirit*. New York: Simon and Schuster.
- White, D. 1995. Divide and Multiply: Culture and Politics in the New Medical Order. In P. Komesaroff (ed.) *Troubled Bodies: Critical Perspectives on Postmodernism, Medical Ethics and the Body*. Durham, NC: Duke University Press, 20-37.
- Wright, J. and Dean, R. 2007. A balancing act: problematising prescriptions about food and weight in school health texts. *Journal of Didactics and Educational Policy*, 16(2): 75-94.