M-HEALTH AND HEALTH PROMOTION: THE DIGITAL CYBORG AND SURVEILLANCE SOCIETY

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Abstract

The new mobile wireless computer technologies and social media applications using Web 2.0 platforms have recently received attention from those working in health promotion as a promising new way of achieving their goals of preventing ill-health and promoting healthy behaviours at the population level. There is very little critical examination in this literature of how the use of these digital technologies may affect the targeted groups, in terms of the implications for how individuals experience embodiment, selfhood and social relationships. This article addresses these issues, employing a range of social and cultural theories to do so. It is argued that m-health technologies produce a digital cyborg body. They are able to act not only as prostheses but also as interpreters of the body. The subject produced through the use of m-health technologies is constructed as both an object of surveillance and persuasion and as a responsible citizen who is willing and able to act on the health imperatives issuing forth from the technologies and to present their body/self as open to continual measurement and assessment. The implications of this new way of surveilling the body's health are discussed.

Key words: m-health, digital technologies, cyborgs, health promotion, social theory, the body

Introduction

I recently attended a one-day symposium on the topic of e-health and social media. There I heard presentations from academics working in medicine and public health about the possibilities of using social media such as Facebook, YouTube, Twitter, blogs and wikis and mobile wireless computer technologies such as smartphones and tablet computers to promote health. Presenters discussed how integrating social media apps with mobile wireless computers allowed for the 'personalising' of health messages, 'reaching into people's everyday lives' by sending them messages tailored to their individual health concerns, conditions and problems. Thus, for example, automated SMS or emails could be individually targeted and personalised: doctors could contact patients directly to remind them to adhere to their treatment programs, health promoters could encourage people daily or hourly to take more exercise, avoid excessive alcohol consumption or smoking or eat healthy foods. One diabetes expert spoke of 'smart pillboxes', which were wireless devices that could not only remind patients to take their medication but also alert a patient's doctor from their home if the patient had failed to conform to their medication regimen. A health promotion academic excitedly described the potential offered by programs within mobile wireless technologies such as accelerometers and GPS systems, which could locate individuals spatially and inform them they were near a park, for example, and thus could take the opportunity to have a walk, or note that they had not moved much in the past hour and therefore needed to spring into action in the interests of their health.

Variously referred to as 'e-health' or 'm-health' ('m' as an abbreviation of 'mobile') tools, such devices can be taken almost anywhere and can connect wirelessly to the internet from most locations. Their users, therefore, are potentially always digitally connected and therefore always reachable in some form. As noted above, even their bodily movements and geographical location can be identified and recorded remotely.

Health promotion journals are also beginning to report upon the importance of using the new social media and mobile devices to promote health (see, for example, an editorial by Catford, 2011). Health promoters have described the use of 'real-time feedback' of users' health status and 'prompts' and 'motivation' messages to 'change unhealthy lifestyle habits' via social media platforms and mobile devices , with reference to controlling such behaviours as smoking, alcohol consumption, exercise, diet and sexual behaviour (Mays *et al.*, 2010; Laakso *et al.*, 2011). One study, for example, reported the use of mobile devices to collect daily information about alcohol consumption among a group of American college students, referring to the devices' ability to administer 'just in time' interventions to intercept unhealthy behaviours as they happen in real-time (Mays *et al.*, 2010). Such researchers frequently make reference to linking health-preventive strategies using m-health devices with 'acceptance of greater personal consumer responsibility for healthy lifestyles', as Mays *et al.* (2010: 311) put it.

The use of mobile devices in health promotion endeavours represents a significant shift in the methods of health promotion. Health promotion has traditionally been a low tech area of public health in comparison with the vast array of medical technologies used in the clinical setting. The primary use of technology in health promotion has tended to be in employing communication media to disseminate illness-prevention messages to a wide audience. Health promotion has borrowed extensively from commercially-oriented social marketing, advertising and public relations approaches and methods to do so. These industries are now embracing social media and mobile devices as part of their publicising efforts. Here again, therefore, health promotion can be seen to be taking the lead from commercial enterprises which are directed at marking and selling commodities.

Both health promotion and commercial social marketing have used internet websites extensively as part of their publicity campaigns. Recent health promotion campaigns have

included the opportunity to interact in an online support or discussion group, or to post and receive messages on Facebook or Twitter about a health-related issue. For example, the Australian 'Swap It, Don't Swap It' and the American 'Let's Move' campaigns, both of which are directed at weight reduction and increased exercise, provide online support, blogs, opportunities for participants to log personal information and links to Facebook pages and Twitter. What the new social media and mobile devices provide which differs from older uses of the internet – that is, Web 2.0 technologies compared with those offered by Web 1.0 – is the opportunity to directly tailor and target health messages on an individual level, to intensify the pervasiveness of these messages and to surveill aspects of embodiment of users of mobile devices.

A vast number of commercial apps have been generated since the advent of smartphones and tablet computers, many of which are directed at consumers who wish to monitor their exercise, alcohol consumption or eating habits in the interests of improving their health or losing weight. Running programs, for example, can be downloaded to one's smartphone or tablet computer which are able to record the number of kilometres run each session, the route taken, automatically report these details to one's followers on social media sites, suggest new routes and remind the user that she or he has not run for a few days. Other apps allow users to enter details of their meals or even take photographs of the food and then analyse the meals for their nutritional value and kilojoule content. The development of similar apps by government health bodies as part of health promotion campaigns, therefore, is an attempt to build on the popularity of such apps and to exploit their potential for recording information about an individual's exercise or dietary habits and providing constant reminders to engage in health-promoting behaviours.

Writers from medical and health promotion backgrounds about the new social media and mobile devices tend to confine themselves in their discussions to describing how these

technologies could be most effectively used as tools in their efforts to help people deal with medical conditions or improve their general health and wellbeing. From a sociological perspective, a more critical analysis may be undertaken of how these technologies may operate to construct various forms of subjectivities and embodiments, including identifying the kinds of assumptions that are made about the target of these technologies and what the moral and ethical ramifications of using them may be. The remainder of this article addresses these issues, drawing upon a range of social and cultural theory to do so.

Technologies, health and the body/self

Medical and health promotion discourses represent technologies as inert devices, fixed in their meaning. From the perspective of sociocultural studies of science and technology, however, technologies, including those used for medical purposes or health promotion, are dynamic and heterogeneous, constantly shifting in their meanings according to the context in which they are used. Such devices are viewed as 'actants' in a network of configuration in which non-human objects are viewed as equally as agential as are humans. Technologies bestow meaning and subjectivity upon their users, just as users shape the technologies and give them meaning as they incorporate them into their everyday practices. Technologies assume certain kinds of capacities, desires and embodiments; they also construct and configure them. Further, technologies are never politically neutral, but rather are always implicated in complex power relationships (Hadders, 2009; Mort *et al.*, 2009; Mort and Smith, 2009; Casper and Morrison, 2010; Mansell, 2010).

The relationship between the human body and computerised technologies began to receive attention from social and cultural theorists in the 1980s. The concept of the cyborg has particularly inspired cultural theorists who have written about the implications of computerised technologies for human embodiment and subjectivity. One of the most influential scholars on this topic, Donna Haraway (1988) argued that individuals in

contemporary western societies had become cyborgs in their interaction with technologies, blurring the distinction between human and machine. Human bodies now interact with a vast number of technologies on a daily basis, ranging from spectacles, hearing aids and telephones to bicycles, aeroplanes and cars, all of which change, extend or enhance human's physical capacities and capabilities. For cultural theorists writing on cyborg bodies, the human-machine hybrid is complex and shifting, calling into question taken-for-granted assumptions about the oppositions between organic/inorganic, natural/artificial and self/Other (Haraway, 1988; Lupton, 1995a; Tomas, 1995; Freund, 2004; Shildrick, 2010).

The concept of the cyborg itself draws from the metaphor of the human body which depicts it as a machine. This metaphor has been dominant in thinking about the body since the industrial revolution, when machines began to have a major influence on people's working and living habits. Since the age of the computer, bodies have frequently been understood as computerised systems and the human brain, in particular, is represented as an organic computer, with hardware, memory networks and filing systems and so on (Lupton, 2003). So too, the immune system is frequently portrayed as a mechanical system, and disease or illness are viewed as the result of an information system malfunction (Haraway, 1989; Martin, 2000). Given the prevailing portrayal of the body as a complex information network and disease as a communication breakdown, medicine itself has become represented as a system of information gathering and synthesis, to the extent that 'mechanical medicine' is being replaced by 'information medicine'.

As part of this change in representations of the body and the growing use of computerised information systems in medicine, the internal organs and workings of the body have moved from being exclusively the preserve of medical students and surgeons to being open to the gaze of all. Online technologies now allow anyone with access to a computer to view highly detailed visual images of the inside of the body. So too, the notion of patients

placing themselves under the care of a doctor and seeking their expert advice has moved to the concept of patients as producing health knowledges and as acquiring expert knowledge so as to manage their illness themselves (Nettleton and Burrows, 2003; Nettleton, 2004; Mort *et al.*, 2009; Mort and Smith, 2009). Nettleton and Burrows (2003; Nettleton, 2004) use the term 'e-scaped medicine' to denote the recent shift in the location of medical knowledge and practice from the medical school and the clinic to diffuse digital information technologies such as the internet and telemedicine devices.

These shifts in representation, knowledge and practice have led to the body not only being thought about and visualised in different ways, but experienced differently. The concepts of the cyborg and 'e-scaped' or 'information medicine' have clear resonances for m-health initiatives. There have been claims that regular use of computerised devices shapes physical aspects of human embodiment, including changing brain structure and functioning, or consciousness, modes of seeing and operating within the world (Lupton, 1995a; De Mul, 1999; Kapitan, 2009). Mobile wireless devices also have implications for how bodies may operate and function. As observed above, these technologies, particularly smartphones which tend to be carried on or very close to one's person throughout the day, are able to monitor and measure their users' behaviours, including their bodily movements. Data may be collected on users' bodies, fed to the Web 2.0 platform for processing and interpreting, and then given back to users to allow them to monitor themselves. Others, including not only health professionals but also friends and contacts on social sites, may be informed of these data. These technologies thus have a 'feedback' or cybernetic mechanism in that they are reactive and active in their relationships with their users as opposed to passively providing information. Such technologies become prostheses, or technological extensions of the body.

M-health and the surveillance society

Surveillance used for medical or public health purposes operates on different levels, from the individual, interpersonal clinical level to the national or global population level. Thus, at the global or national level, health surveillance systems are used to record and monitor cases of illness, conditions such as obesity or infection to maintain records of epidemiological changes in disease or illness patterning. In the individual medical encounter, doctors practice a type of personalised surveillance over each of their patients, testing, measuring and investigating features of patients' bodies, constructing and maintaining health records, noting patients' adherence to their advice and so on. Medical technologies have for centuries been employed to render the body more visible, to exert a biopolitical gaze upon bodily structure and function (Foucault, 1975; Armstrong, 1995; Casper and Morrison, 2010). Mobile wireless devices are the contemporary end of a long line of such surveilling devices. Telemedicine and telecare technologies now enable health care professionals to examine and diagnose patients' bodies remotely. Mobile devices allow for many biometric readings to take place from any location. Devices implanted into the body have increasingly used software which allows them to communicate wirelessly with medical professionals, irrespective of the patient's physical location.

The use of m-health in health promotion extends the temporal nature of health surveillance, and allows for further refinements of the categorising and identifying of 'risk factors' and 'at risk groups' that are then deemed eligible for targeting. Health-related data may easily and frequently be collected from users' mobile devices each time they log on to the relevant app. Such devices thus offer an unprecedented opportunity to monitor and surveill individuals' health-related habits. These technologies are now becoming used not only to facilitate medical supervision and monitoring of ill bodies, but now are being extended into the realm of well bodies in the attempt to prevent illness and disease.

As this suggests, central to a critical analysis of the use of the new social media and mobile devices to promote health is a recognition of these technologies as part of 'surveillance society', a term used by some writers to denote the increasing ubiquity of surveillance technologies in everyday life which are used to record, survey, monitor and discipline people (for example, Haggerty and Ericson, 2000; Lyon, 2007; Lyon, 2010; Bennett, 2011). It has been argued by these writers that surveillance is a condition of modernity, essential to the development of the capitalist economy and the contemporary nation state and central to forms of disciplinary power and the maintenance of social order. The fastest growing and most controversial specific type of surveillance is that using the processing of personal data gathered from computerised devices 'for the purposes of care or control, to influence or manage persons and populations'. These include loyalty cards offered by businesses to their customers, PINs, information gathered by websites when they are accessed by users and ticketing systems at airports. The digital data produced by these forms of surveillance serve to individuate users, distinguished from others and identified by a series of criteria and then behaviour analysed, to produced 'surveillance knowledge' (Lyon, 2010).

Various kinds of social relations and interactions, including power relations, are created in and through surveillance technologies. These technologies may be considered part of the production of the citizen in neoliberal societies. Through the sorting and typing of individuals, allowing the development of profiles and risk categories, policies and strategies of inclusion and exclusion operate. Various types of individuals are identified as requiring greater forms of disciplinary control. Not only is personal information gathered via the use of surveillance technologies, but individuals can easily be grouped or sorted into discrete categories and classes based on this information and then subjected to assessments based on prior assumptions (Lyon, 2010; Bennett, 2011).

The Foucauldian concept of the panopticon is often employed in writings on surveillance societies. The panopticon is a literal architectural structure, a prison first proposed by eighteenth-century reformer Jeremy Bentham. The concept of the panopticon is used metaphorically by Foucault in his well-known work Discipline and Punish: the Birth of the Prison (1977) (Lupton, 1997)to suggest the operations of power in contemporary societies. The panopticon prison was a structure designed so that the monitoring gaze of those in power could operate centrally to observe inmates in their separate cells, who were unaware of when exactly they were being watched. This design allowed a small number of those in authority to observe a large number of individuals. The concept included the idea not only that prisoners should be observed by those in authority, but also that they should ideally develop self-surveillance and disciplining strategies in the effort to improve themselves. This approach to management of problematic populations was also taken up in relation to other institutions, such as the hospital and the school. For Foucault, the panopticon was representative of a new form of power, one in which central surveillance and monitoring of individuals was combined with those individuals developing voluntary self-management techniques. The panopticon metaphor emphasises the role played by 'the gaze', surveillance and visibility in the new forms of power relations emerging in the eighteenth and nineteenth centuries, but has clear resonances for surveillance society today (Haggerty and Ericson, 2000; Brignall, 2002; Elmer, 2003; Caluya, 2010).

The emergence of m-health potentially reconfigures the subject of surveillance and complicates the concept of the panoptic gaze. While there still may be an expert exerting the panoptic gaze upon the individual, such as in the case of the health promoter making decisions about who should be part of a targeted 'at risk group' and thus encouraged to receive health-promoting messages on their mobile devices or to subscribe to Twitter updates, these technologies also encourage users to turn the gaze upon themselves or to

actually invite others to do so. Such media platforms as Facebook and Twitter allow people to share personal information with hundreds or more of their friends or followers, including regular automated updates on their exercise and dietary habits or body weight via the kinds of apps described above. Here friends and followers are invited to contribute by the user to monitor their bodily habits: the net of surveillance is thus expanded around the user's body. The panoptic gaze in this case becomes inverted, so that instead of the few watching the many, the many are watching the few.

One example of this phenomenon is an American woman with diabetes described in a health magazine article. This woman uses social media to help her manage her condition, as well as home-based technologies to monitor her blood glucose levels. She regularly reports, on her blog and via Twitter, her daily activities and symptoms: what she ate for breakfast, what her blood readings are or how much exercise she has engaged in that day. This woman's motivation for providing these details to her readers and followers is the support they in turn give her in managing her condition. As she is quoted as saying:

> Because I have people who follow me in Twitter … it means I have some kind of audience that is caring for me in the background. It's helpful if I'm having a rough day, if things are not going so well with my blood sugar. I find support there, and it keeps me in line too. (cited in Hawn, 2009)

As these comments suggest, the use of m-health technologies blur the spatial boundaries between public and private surveillance, bringing public surveillance into the domestic sphere. They construct users as personally responsible for their own health care and management but also as part of a heterogeneous network of actants, which include the various technologies employed but also friends and contacts. Perhaps more useful than theories of the panoptic gaze, therefore, is that which employs the Deleuze and Guattari term

‘assemblages’ to describe ‘surveillant assemblages’, or the complex interaction of technologies, data and bodies in producing defined subjectivities (Haggerty and Ericson, 2000). The concept of assemblages recognises the heterogeneity of objects which combine to form certain types of bodies/selves as well as their constantly shifting and dynamic nature. It also acknowledges the role played by non-human actants such as technologies in producing bodies/selves. In relation to surveillance technologies, assemblages are created when information about individuals is derived via surveillance technologies and then reassembled for various purposes, creating a certain type of subject, or ‘data doubles’ or ‘data selves’ which can then be scrutinised, monitored and used for various purposes, including intervention (Haggerty and Ericson, 2000; Elmer, 2003).

Writing about ‘surveillance assemblages’ Elmer (2003) has contended that:

> The observed body is of a distinctly hybrid composition. First it is broken down by being abstracted from its territorial setting. It is then reassembled in different settings through a series of data flows. The result is a decorporealized body, a ‘data-double’ of pure virtuality.

Yet it may also be argued that the body as it is produced via m-health technologies is far from being ‘decorporealised’. While the abstracted ‘data-double’ produced through biometric measurements and health surveillance technologies which are able to identify ‘at-risk’ individuals may be categorised as a virtual cyberbody, this data-double feeds back information to the user in ways that are intended to encourage the user’s body to act in certain ways. The flow of information, therefore, is not one-way or static: it is part of a continual loop of the production of health-related data and response to these data. This assemblage also challenges previous representations of the cyborg, in which utopian ideas about the use of technology in transcending the imperatives and constraints of the fleshly body were often

dominant (Buse, 2010). The cyborg body configured by m-health technologies, in contrast, support a reflexive, self-monitoring awareness of the body, bringing the body to the fore in ways which challenge the non-reflexive, absent body (Leder, 1990). The body is hardly able to disappear when its functions, movements and habits are constantly monitored and the user of m-health technologies is made continually made aware, via feedback, of these dispositions.

Privacy, intimacy and ethical issues

Where once public health promotion campaigns used public space and public media to convey their messages, mobile wireless devices allow the incursion of messages into the most intimate and personal spaces. Privacy issues have often been raised in discussions about new digital media, including social media platforms and mobile devices. Some writers have questioned whether the current era of personalised computerised technology use, social media and wide-spread surveillance has meant 'the end of privacy' (Lyon, 2010)? Have concepts of privacy narrowed to liberal assumptions about subjectivity, are they too culturally relative or overly reliant on rights-based discourses, neglectful of new ways of living and being? Can the spatial meanings of privacy, which represent privacy as a kind of personal zone from which others are excluded unless given permission to enter, remain meaningful in a context in which wired consumers are available for surveillance and data gathering for much of their waking day (Bennett, 2011)? Does the concept of privacy now have any meaning in such a context? As Ericson and Haggerty (Haggerty and Ericson, 2000) note, in an era in which personal information may be effectively sold, privacy is now something that may be traded for services or commodities, and perhaps has lost some of its value.

What has been termed 'the politics of gazing' (Ibrahim, 2010) is relevant to the discussion here. Ibrahim notes that the personal space has become 'a coveted commodity where new technologies, innovative designs and convergence occur and coalesce' (2010). The politics of gazing presents new challenges and ethical and moral dilemmas. These

dilemmas are located within the space of the body because of the mobility of the new mobile devices. Because these devices are always around one's person and in one's personal sphere, effectively as prostheses of the cyborg body, it can be difficult to 'switch off' (Agger, 2011; Matusik and Mickel, 2011). Many users of social networking platforms are grappling with coming to terms with new ways of defining privacy in a context in which concepts of 'the public' and 'the private' are no longer confined to a spatial dimension. Notions of intimacy, solitude, the personal, the secret and the hidden are challenged by the confessional of social media sites such as Facebook and Twitter, in which participants' inner thoughts and private behaviours are often revealed to a large number of friends or followers, and frequently several times throughout the day. This phenomenon has been referred to as 'the privatization of the public and publicization of the public' (van Mamen, 2010).

The sense of intimacy and social support that many users derive from using social media may readily translate to uploading information about their bodies using the kinds of m-health apps described above. Such information may be regarded as contributing to the persona that is constructed via social media sites: sharing attempts to reduce smoking or drinking, or to engage regularly in exercise, for example, and receiving supportive messages in response, as well as commiseration for those times when the user fails to achieve her or his goals of self-improvement and discipline. However, users may still feel uncomfortable about what they perceive as exposure and invasion of personal space. They may also feel 'invaded' by the sheer overload of data that may be generated by membership of social networking sites and the difficulty of switching off mobile devices and taking time out from using them (Boyd, 2008).

There are other moral and ethical issues associated with the use of such monitoring devices. Accounts of using m-health technologies in the medical literature dealing with patient follow-up and care tends to focus on shifting responsibility for care from the clinician

to the patient, placing new expectations upon the patient to manage their health in ways that were traditionally viewed as the preserve of health care professionals. The rhetoric of such accounts uses such terms as 'patient empowerment' as well as cost-efficiency as positive outcomes of this shift of responsibility. The patient is represented as ideally willing to take on such responsibility, as active and agential in engaging in participating in the monitoring of her or his own body (Mort *et al.*, 2009; Andreassen, 2011). What is often glossed over or ignored in this discourse of patient responsibility for self-surveillance are the inherent inequalities that are reproduced in the use of medical information and monitoring technologies, including issues of access to such technologies (Nettleton and Burrows, 2003). Neither are the emotional dimensions of using such technologies acknowledged: some patients' emotional need to devolve responsibility to their health professionals, for example. Not all patients wish to become reflexive, agential and 'empowered consumers' of health care (Lupton, 1997; 2003; Andreassen and Trondsen, 2010).

So too, the m-health discourse in health promotion represents people as ideally willing to take on responsibility for promoting their health using these latest technologies, to the point that they are happy to receive regular messages on their smartphone or to have their health habits and behaviours continuously monitored and assessed. This is a body/self configured as requiring, and in fact desiring, of constant digital surveillance.

Health promotion models of behaviour tend to be dominated by social psychology theories which focus on individuals' behaviour to the exclusion of the socio-political context in which individuals live. Such use of social media tools build upon the 'magic bullet' approach to conveying health-related messages to members of the general public which has been a mainstay of health promotion models of behaviour for several decades and the continuing subject of critique from sociologists for equally long (see, for example, Lupton, 1994; Bunton *et al.*, 1995; Lupton, 1995b; Petersen and Lupton, 1996; Bunton, 2006;

Petersen, 2010). As these critics have argued, the individualistic, targeted approach that appears such an enticing aspect of social media is also its disturbing property. By focusing on the individual, sending regular messages to encourage that person to exercise or eat well, these technologies reduce health problems to the micro, individual level. The discourses on m-health, like those in health promotion generally, tend to suggest that if an individual fails to adopt the suggestions of the texts or emails they received, that person is fully responsible for the health problems they may experience. Such approaches do little, therefore, to identify the broader social, cultural and political dimensions of ill-health and the reasons why people may find it difficult to respond to such messages. They also do not address the possibilities that the continual use of the devices may create unintended consequences such as stress, unwanted distraction from other activities or the infringement upon intimate relationships.

The new m-health technologies may be viewed as potentially contributing to feelings of shame and guilt that their target users may feel if they do not adopt health-related suggestions, an additional stressor in an individual's day when they may well be juggling multiple demands and responsibilities. There is certainly a patronising, 'we know better' discursive representation of the relationship between the health promoter and the mobile device user in the public health literature, in which the health promoter attempts to find new and better ways of encouraging members of the public to change their ways to achieve a 'healthy lifestyle' as it is defined in official public health arenas.

It would be misleading, however, to represent the use of m-health technologies as simply oppressive, coercive or in other ways limiting of individuals' agency and freedom. As the theoretical perspectives drawn from both Foucault's writings and those of Deleuze and Guattari would argue, the power relations implicit in surveillance technologies are not necessarily coercive or repressive. Power is diffuse, spread over many networks, operating not only from state agencies but also manifold non-government organisations such as those in

commodity culture and the mass media. Power may also be viewed as productive, bringing certain kinds of subjectivities and embodiments into being. Individuals are not coerced into providing information or downloading health-related apps which remind them to exercise, eat well or take their medications. They do so voluntarily and willingly in their efforts to improve their health or physical fitness, reduce their consumption of alcohol, give up smoking or lose weight. As part of presenting the self and disciplining and shaping one's body in certain ways, citizens adopt public health injunctions or warnings in their own best interests, to produce their 'best selves'. In the term used by Deleuze and Guattari, 'desire' impels their use of m-health platforms and devices. Nonetheless it is also important to point out that there are compulsions associated with choice (Petersen, 2010). Individuals make choices not in a social vacuum, but in a context in which certain kinds of subjects and bodies are privileged over others and there are obligations and commitments involved: the responsible, self-disciplined body/self, for example, who is interested in and motivated to improve their health.

Conclusion

To conclude, the new forms of computerised technologies offered by Web 2. platforms and mobile wireless devices offer new forms of capacities, embodiment and subjectivities. They configure the assemblage of an idealised consumer who is amenable to monitoring, surveillance and disciplining of their body by way of individualised automated messages and the feedback and sharing of biometric data. They also configure the professional figure of the health promoter in a different way. The health promoter becomes an individual who is conducting surveillance in an ever-more refined and diffuse manner on members of the target population, using technologies in unprecedented way. Via m-health technologies, the health promoter is able to insert her- or himself even more insistently into the private world of others, accessing them in any location in which their mobile device accompanies them.

A space is opened up here for researchers to identify and explore the experiences of individuals as they take up (or indeed, resist) the potentialities of mobile devices and the new social media as they are adopted into the 'toolbox' of health promotion. Questions that have yet to be answered include: what are the implications for subjectivities and embodiment in the world of m-health – how are the assemblages of technologies/practices/flesh enacted and lived? What are the political dimensions and power relations inherent in the use of m-health technologies? How will privacy (or loss of privacy) be defined and experienced in the context of these media? What are the implications for how people conduct their everyday lives and intimate relationships?

There is much talk in health promotion circles about 'health literacy', or knowledge and understanding about health and preventing ill-health that certain social groups develop. Perhaps it also needs to be acknowledged that 'digital literacy' should become a part of health literacy, and that indeed, such digital literacy might include a response on the part of targeted audiences to forms of health promotion messages conveyed via mobile devices and social media platforms that is critical and contesting of them. An integral aspect of Web 2.0 technologies is the space they provide for audiences and consumers to engage with each other, to resist attempts to position them in certain ways, to challenge power relations: in short, to 'talk back' to those who may be attempting to change their behaviours, both individually and collectively. Will the 'nagging voices' of the health promoting messages automatically issuing forth from a person's mobile device be eventually ignored by its user? Or will these messages incite even greater feelings of guilt and shame at one's lack of self-control and self-discipline? Alternatively, will m-health technologies produce a cyborg, post-human self in which the routine collection of data about bodily actions and functions is simply incorporated unproblematically into the user's sense of selfhood and embodiment? How will concepts of 'health' itself be shaped and understood in a context in which one's

biometric indicators may be constantly measured, analysed and displayed publicly on Facebook or Twitter? Will the 'objective' measurements offered by mobile devices take precedence over the 'subjective' assessments offered by the senses of the fleshly body? Addressing these questions, and many more, offers a rich seam of inquiry for social researchers and theorists interested in exploring the implications of the emergence of m-health.

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