

Barbara L. Marshall; Stephen Katz

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2016

<https://doi.org/10.25969/mediarep/893>

Veröffentlichungsversion / published version

Zeitschriftenartikel / journal article

### Empfohlene Zitierung / Suggested Citation:

Marshall, Barbara L.; Katz, Stephen: How Old am I? Digital Culture and Quantified Ageing. In: *Digital Culture & Society*, Jg. 2 (2016), Nr. 1, S. 145–152. DOI: <https://doi.org/10.25969/mediarep/893>.

### Erstmalig hier erschienen / Initial publication here:

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## How Old am I?

### Digital Culture and Quantified Ageing

Barbara L. Marshall and Stephen Katz

#### Abstract

*In previous work we argued that ageing bodies and changes across the life-course were becoming measured, standardised, and treated according to a new logic of functionality, supplanting traditional categories of normality (Katz/Marshall 2004). In particular, the binary between the 'functional' and the 'dysfunctional' has become a powerful tool in mapping and distributing bodies around data-points, functional subsystems, and posthuman informatics. In this paper, we extend this line of analysis by exploring how current developments in self-tracking technologies and the proliferation of digital apps are creating new modes and styles of 'quantified ageing'. In particular, we identify four interrelated fields for inquiry that are specifically relevant in setting out a research agenda on ageing quantified selves and statistical bodies: 1) 'Wearables' and mobile technologies, including both technologies designed for self-monitoring/self-improvement (health, fitness, sleep, mood and so on) and those designed for surveillance of and 'management' of ageing individuals by children, caregivers or institutions. 2) Digital apps, including those that collect and connect data uploaded from wearable devices, and those that deploy various algorithms for 'calculating' age and its correlates. 3) The rhetorics of games and scores in age-related apps such as those used in digital 'brain training' games that track a person's imagined cognitive plasticity and enhancement, while promising protection against memory loss and even dementia. 4) The political economy of data sharing, aggregation and surveillance of ageing populations. Conclusions ponder wider sociological questions; for example, how will the insurance industry acquire and use data from digital health technologies to produce new actuarial standards? How will older individuals plan their futures according to the risks assembled through quantifying technologies? We argue that the technical turn to new ways of quantifying and standardising measurements of age raises a range of complex and important questions about ageism, agency and inequality.*

## Introduction

Researchers in ageing studies have recently moved away from biological and biomedical models of age to re-imagine the complex subjective and culturally mediated ways in which age is embodied, measured, and expressed in multiple and non-chronological ways. At the same time, the proliferation of new consumer and health technologies aimed at enabling self-knowledge and self-tracking has raised important ethical and sociological questions about measurement, standardisation, surveillance, risk-management, selfhood and sociality. These questions are of great relevance to ageing populations and individuals as their healthcare supports shift from governmental to individual realms of responsibility. However, age has been largely neglected in the rapidly-expanding research community exploring these technologies.

In previous work we argued that ageing bodies and changes across the life-course were becoming measured, standardised, and treated according to a new logic of *functionality*, supplanting traditional categories of normality (Katz/Marshall 2004). In this contribution, we extend this line of analysis by suggesting that current developments in self-tracking technologies and the proliferation of digital apps are creating new modes and styles of 'quantified ageing'.

We begin by drawing on recent work in cultural gerontology on the complexities of measuring age in contemporary biosocial regimes, and then sketch out some interrelated fields for inquiry that are specifically relevant in setting out a research agenda on *ageing* quantified selves and statistical bodies

## Cultural Gerontology and the Recalibration of Age

Sociologists of post-traditional society contend that the conventional stages of life have become contingent and negotiable. New work, retirement, residence and intergenerational relations have created conditions whereby the experience of ageing is no longer chiefly defined by chronological age. Cultural gerontologists have argued that the current blurring of life-course identities, the longevity stretch in population ageing, the globalisation of ageing spaces, the popularity of anti-ageing industries and the new contingencies around life transitions have rendered the measuring of human ageing increasingly indeterminate in the wake of a postmodern life course (Gilleard/Higgs 2005; Katz 2005; Katz 2014; Marshall 2015). While even the gerontological sciences have struggled with alternative, non-chronological age definitions (Moreira 2015a; 2015b), age is still being measured and quantified via a pervasive logic of functional age grounded in the aggregation of physical capacities. In particular, the binary between the 'functional' and the 'dysfunctional' has become a powerful tool in mapping and distributing bodies around data-points, functional subsystems, and posthuman informatics, making bodies available to a wide variety of techniques of measurement, standardization and intervention (Katz/Marshall 2004). While functional age may appear to diversify ageing

and liberate it from the constraints of chronological biomarkers, its mapping of the ageing body is aligned to our ageist culture that reduces the social determinants of ageing to matters of individual choice and responsibility. What have been termed ‘biosocial’ technologies produce images of life, including ageing, as infinitely modifiable and open to being optimized (Hogle 2005; 2007; Rose 2007). Neoliberal styles of self-care redistribute the capacities of the body across a wider biosocial order of ageing. Further, the biosocial order is one that encourages people to congregate as biocitizens around various diagnoses (Rose/Novas 2005), and more recently, as quantified selves (Barrett et al. 2013; Nafus and Sherman 2014; Ruckenstein forthcoming). Thus, the biosocial order and its incorporation of functional age becomes the contextual background for understanding how self-tracking, digital and ‘smart’ technologies for older people integrate populational surveillance, individualized care, agential policies (such as ‘active ageing’), marketable health-products and new risk-averse social strata.

## The Technologies of ‘Quantified Ageing’

Three types of technologies related to tracking and measuring age and age-related capacities are of interest here: a) wearable technologies; b) age-related algorithms; and c) incentivisation through the rhetoric of games and scores.

a) Wearable technologies, one of the key trends at the 2015 Consumer Electronics Show (Bowman 2014), include those linked to self-monitoring and tracking (such as FitBits), and those designed to also permit monitoring and tracking by others (such as Tempo or Lively), with only the latter explicitly linked to age. Lupton (2014b) is instructive in positioning a sociological approach to self-tracking as emphasizing its meaning in relation to “... wider discourses on technology, selfhood, the body and social relations that circulate within the cultural context in which the practice is carried out” (Lupton 2014b). It is these discourses that the research proposed here is aimed at unpacking and analysing, especially since age, while figuring prominently in such discourses, has also been neglected in the growing research on self-tracking and ‘quantified selves’.

Wearable tracking technologies designed specifically for ageing individuals are designed less as technologies of self-knowledge than as tools to enable others to monitor and assess such individuals’ functions, abilities and locations. For example, the external process of collecting on an individual’s movements can issue machine-generated alerts if deviations are noted from established patterns of movement. While some research on these ambient monitoring systems suggest that they may be positively received (Hossain/Ahmed 2012; Sixsmith 2000) questions have been raised about both their ethical implications and efficacy (Lie/Lindsay/Brittain 2015; Mortensen/Sixsmith/Woolrych 2015; Neven 2015; Pritchard/Brittain 2015).

b) In a range of digital applications, algorithms are used to analyse, link and compare data and to identify patterns as the basis of decision-making.

As boyd and Crawford argue, they are part of the mythology of ‘big data’, purporting to offer “a higher form of intelligence and knowledge that can generate insights that were previously impossible, with an aura of truth, objectivity and accuracy” (2012: 663). The algorithmic logic that underpins digital applications reflects a particular confluence of expert discourses, statistical knowledge and standards which can be met or can set markers of failure or risk. With respect to self-tracking, individual measures (such as step count or heart rate) become part of estimates of risk. In devices designed for tracking others, machine-learning technology is employed to determine deviations from ‘normal’ routines indicated by, for example, the number of times the refrigerator door was opened or the length of time spent out of bed between hours designated as sleep time. Other apps promise to measure and calibrate age and age-related functions and risks in various ways. For example, Microsoft’s Age Robot, unveiled at its 2015 developer’s conference, uses facial recognition and machine-learning technologies to predict age from photographs. *RealAge* – a site promoted by popular TV doctor Mehmet Oz – promises to tell you how old you really are on the inside based on information you enter about your family history and lifestyle. Canadian tech start-up Vivametrica feeds chronological age, gender, BMI (body mass index) and average daily ‘step count’ into its algorithm, and then calculates your relative risk for the four most common age-related chronic illnesses. Because ‘BMI’ and ‘step count’ are themselves calculated estimates, self-knowledge gleaned from self-tracking and monitoring are already assumed. These are just a few recent examples of what might be called ‘ageing by algorithm’.

c) ‘Gamification’ increases the consumer appeal of self-trackers and digital tools. The rhetoric of games and scores has been widely deployed to incentivise and represent ‘progress’ (Millington 2009; Rich/Miah 2014), to produce commercially useful data (Till 2014) and to make surveillance ‘pleasurable’ (Whitson 2013). Of particular interest here are ‘brain training’ and cognitive enhancement apps which are marketed to ageing individuals as tracking a person’s imagined cognitive plasticity and enhancement, while promising protection against memory loss and even dementia. ‘Brain-boosting’ computer games such as *BrainAge 2* or those provided by HAPPYNeuron fill the pages of retirement and lifestyle magazines. Research has demonstrated that they exaggerate their benefits, which are mostly imagined into existence through score-keeping, expert testimonials, and excitedly shared maximal/minimal standards (Millington 2011). Indeed, for older individuals, the entire brainwork enterprise creates ambiguous images of ageing – both positive and improvable, but negative and inevitable. These developments are especially salient in a culture terrified of memory loss and dementia, sensationalised in the media by their negative images of population ageing ‘tides’, ‘tsunamis’, ‘storms’, and ‘bombs’, along with zombie scenarios of demented ‘never-ending funerals’ and lost souls (Zeilig 2014).

## The Political Economy of ‘Quantified Ageing’

All of these technologies of tracking and measuring need to be located in the political economy of data sharing, aggregation and surveillance of ageing populations. Some research suggests that data sharing may produce new forms of sociality, as virtual communities form around common interests (Nafus/Sherman 2014). Little research has been undertaken in this respect with older adults, although previous research on older technologies, such as walking clubs using pedometers, suggests that the sociality was more significant than the technology (Copelton 2010; Oxlund/Whyte 2014). Of particular interest to our research are the implications of data aggregation for monitoring older populations. According to data analytics firm Vivametrica, “wearable activity monitors produce more biometric data than the combined public health surveys of every nation on the planet” ([www.vivametrica.com](http://www.vivametrica.com)). An entire industry has developed around capitalizing on digital tracking technologies (Rocketfuel 2014) making bodies into nodes, or collections of data points, in the “internet of things”. In an era of ‘big data’ and algorithmic surveillance (Cheney-Lippold 2011; Ball/Murakami-Wood 2013; Lyon/Bauman 2013; Bennett et al. 2014; Klausner/Albrechtslund 2014; Lupton 2014a; Mortensen/Sixsmith/Woolrych 2015) the extent to which the devices and technologies of digital culture we have discussed may intensify dividing practices which categorize us functional/dysfunctional, young/old, active/inactive, fit/frail is an important line of analysis.

Tracking and quantifying technologies have already become part of ‘speculative futures’ of ageing, linking as they do the biopolitics of ageing populations to the anatomo-politics of ageing bodies. How will the insurance industry acquire and use data aggregated from these technologies to produce new actuarial standards of success in ageing? How will normative conceptions of responsible ageing bodies shift? Will they be those that self-track and self-monitor? Do they offer themselves up to remote monitoring and tracking as a means to maintaining ‘independence’? Do they demonstrate measurable efforts to forestall discernible ageing – physical and cognitive? Are they those that conform to algorithmic standards of controlled risk for dependency? How, as they engage with these technologies, do older people themselves contribute to the re-calibration of age and age-related characteristics, and to the reshaping of age as a social category? All of these questions may underpin debates about care policy and the distribution of scarce resources in ageing societies.

To summarize, the proliferation of new technologies aimed at enabling self-knowledge, and the tracking of selves and others, has raised important ethical and sociological questions about measurement, standardization, surveillance, risk-management, selfhood and sociality. However, in the growing body of work on quantification and self-tracking cultures, age still figures mostly as simply a dimension of social inequality that may be associated with less access, interest or skill in using digital technologies (see for example Lupton 2013). We argue that there are much larger questions at stake, and we hope to encourage researchers to explore the ways that current developments in self-tracking technologies and

the proliferation of digital apps are creating new modes and styles of 'quantified ageing'. At a time when technological developments, demographic shifts and changing regimes of governmentality conjoin to problematize bodies – and here, specifically ageing bodies – a range of difficulties is presented in how to conceptualize, manage and optimize those bodies. We should not be surprised, then, as Nikolas Rose suggests, “that one response is [...] to seek to discipline these difficulties, to find some algorithms to adjudicate about them, to standardize procedures for the potentially conflictful decisions concerning them” (2007: 256). The technical turn to new ways of quantifying and standardising measurements of age exemplifies this response. Our argument is not to gainsay that new technologies may benefit the lives of older people (Schillmeier/Domenech 2010; Sixsmith/Gutman 2013), but to assert that such technologies cannot be assessed outside the social contexts in which they are developed, promoted, used and capitalized. Technologies that track, quantify and compare may indeed assist older people age more 'successfully', and 'age in place' more securely, but they also raise important questions about ageism, agency and inequality.

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