

# Silver linings

Despite the perception that academics are at their most creative early on in their careers, research shows that today's innovators are considerably older than they were a century ago. Universities must adapt accordingly, argue **Amanda Goodall** and **John Montgomery**

Life expectancy is lengthening. The latest predictions are that a child born in the UK in the early part of this decade will live for 79 years if they are a boy and 83 years if they are a girl. The Office for National Statistics forecasts that about one in three babies born in 2013 will live to celebrate their 100th birthday.

For those of us with a little more wear and tear, life expectancy at the age of 65 has also increased considerably in the past 30 years, by 40 per cent for men and 25 per cent for women, to 18 and 21 years, respectively.

And just as we are living longer, so, since the introduction of anti-age discrimination laws in the UK in 2006, whether through choice or necessity, many of us are working longer.

This is particularly true for academics, who have opted for a career with low physical demands and which, traditionally at least, allows high levels of autonomy. In some US universities, a third of academics are now 60 or older and the age profile of UK researchers is also shifting upwards (see graph, page 38). Actuaries have known for some time that high educational attainment is linked to a longer working life, so perhaps this should not come as a surprise. There is good evidence that older academics are publishing top-class research, and it will be interesting to discover the age distribution of academics whose research papers were submitted to the recent research excellence framework when the results are published in December.

But is churning out papers the best use of their talents? Should we be incentivising academics into producing four publications every few years no matter what their age? Or should some of our best researchers instead become spokespeople – “public intellectuals” – whose primary role is to challenge government and business propaganda, defend science and occupy important leadership positions?

How should universities adapt to an ageing population of scholars?

“Age is, of course, a fever chill/that every physicist must fear/He’s better dead than living still/when once he’s past his 30th year,” wrote Paul Dirac, who won the Nobel Prize for Physics in 1933, aged 31.

Although the population is ageing, it is often assumed that great innovators are young. In maths, the view is even institutionalised; its highest honour, the Fields Medal – often described as the mathematician’s Nobel prize – is awarded only to those who make an outstanding discovery before they reach 40.

Dirac believed that academics should accept their fate and end their intellectual endeavours a couple of years after passing their probationary period. Yet today, it seems, this is the age at which they are just getting started.

Despite the popular perception, innovators are considerably older than they were a century ago. In an article in the *Proceedings of the National Academy of Sciences* in 2011, Benjamin Jones, associate professor of management and strategy at Northwestern University, and Bruce Weinberg, professor of economics and public administration at Ohio State University, analysed data on 525 Nobel



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prizewinners in physics, chemistry, and physiology or medicine. They looked at two awards periods: those between 1901 and 1984 (the early period) and those between 1985 and 2008 (the late period). They found that the average age of Nobel recipients was 37 in the early period and 47 in the late period. In other words, not only has there been a demographic shift in our universities but the relationship between age and creativity has also altered. Today, most Nobel prizewinners and great inventors make their notable breakthroughs at around the age of 40; in physics specifically, the mean age of Nobel prizewinning achievements since 1980 is 48. The authors found that in the age-creativity relationship, time matters more than field: the same shift has happened across many disciplines, with discoveries taking place later on in people’s careers.

The reason for this shift may partially lie in

the method of investigation. In a study of the life-cycle creativity of Nobel laureate economists, Weinberg found two distinct patterns: empirical innovators work inductively, accumulating knowledge from experience, whereas theoretical innovators work deductively, applying abstract principles. Theorists and empiricists appear to peak at different points in their career. The theorists produced their best work at the age of 25, showing that Dirac’s prediction is true for some. However, investigators working experimentally peaked in their mid 50s. Presumably, with age comes greater knowledge about the world, which feeds into the development of new hypotheses to be tested with data.

Research by Daniel Hamermesh, a professor in economics at Royal Holloway, University of London, on the changing age of authors of articles in leading economics journals found

**In 2006, the Employment Equality (Age) Regulations prohibited discrimination on the grounds of age in relation to employment and training.**

The regulations also introduced a default retirement age of 65 and a right for employees to request to continue to work past their retirement age.

These latter provisions were removed on 1 October 2011 in an amendment to the Equality Act 2010, making mandatory retirement imposed by an employer

unlawful unless it can be justified on the basis that it achieves a legitimate aim and that retirement is a proportionate means of achieving that aim.

Managing Flexible Retirement and Extended Working Lives, a project conducted by the Equality Challenge Unit and the Centre for Diversity Policy Research and Practice, at Oxford Brookes University, concluded that in light of the legislation, higher education institutions should:

- Work to understand employees’ attitudes towards retirement and

clearly communicate the different options (such as flexible retirement, bridging jobs or associate work) once they reach pensionable age, to allow staff to make informed decisions about their late careers.

- Take a “holistic approach” to managing age, such as developing internal career paths, intergenerational teams and flexible working, thereby adopting an approach to employment that

considers the whole life-course.

- Work in partnership with trade unions and employees’ representatives to manage the sometimes “diverging but legitimate interests” of employers and different employees: of older workers, who may wish to continue to have active working lives, for example, and of younger workers, who may have concerns about access to jobs and career opportunities.

Source: Equality Challenge Unit

that in the past five decades the proportion of older authors had almost quadrupled. In 1963, a small proportion of authors were over 50 but by 2011 that figure was more than 20 per cent. There is some evidence that scholars are starting their academic careers later, partially because their training period has lengthened, which may help to explain this trend. In addition, Hamermesh argues, the abolition of mandatory retirement for academics in the UK in 2011 (1994 in the US) has increased the financial incentives to continue publishing. Indeed, as Caroline Priday, head of the European office of Princeton University Press, recently commented, many of the press’ best-selling books are written by older academics, suggesting that continuing to publish can be worth the effort.

A few years ago, the “greying” of research in the US was discussed in the journal *Science*. At that point, in 2008, the average age of National Institutes of Health grant recipients was 51, and the average age for a first grant was 42. NIH projections suggested that by 2020, grants to scientists over the age of 68 could outnumber those given to researchers under 38. The swing in age worried some research leaders, who were concerned that adequate funds should be available for the next generation of investigators. But inter-generational problems such as a drop in the number of grants awarded to young researchers would self-correct to some extent if the transition from lab to teaching, mentoring or retirement were made easier, the article suggested.

Undoubtedly, following the phasing out of the default retirement age, a large percentage of academics will choose to retire in their mid to late sixties. Many will have tired of research and teaching, and some may have lost their ability or inclination to perform in these areas at a high level. But a significant proportion will not want to stop work or may not have adequate pension provision to enable them to retire.

When Orley Ashenfelter from Princeton

**When compulsory retirement was removed in US universities, the rate at which academics stepped down in their early seventies fell by two thirds**

University and David Card from the University of California, Berkeley, studied the impact of the 1994 ruling outlawing mandatory retirement in US universities, they found that when compulsory retirement was removed, the rate at which academics stepped down in their early seventies fell by two-thirds.

It is interesting to look at research on human happiness in this light. Economists and happiness researchers Andrew Clark, research professor at the Paris School of Economics, and Andrew Oswald, professor of economics at the University of Warwick, first identified in the early 1990s that happiness is U-shaped in relation to age. This means that people begin life in an optimistic and happy state but as we progress through the years our happiness declines, reaching its lowest point around middle age – when there really is (in the data) a mid-life crisis. At this time, around our late thirties or early forties, we are more likely to have a crisis or suffer from mental health problems. In roughly our mid to late forties, the data show that human happiness rises again, and keeps on rising until the effects of very old age impinge. This pattern has been found in numerous datasets from around the world, and with the inclusion or not of control variables; in 2012 the result was replicated in a sample of humans’ relatives, the great apes.

Why happiness is U-shaped is not exactly known. Speculating is not too difficult, however. We may recognise (or remember) the psychological pressures associated with sorting out our own identity, the accumulation of work and family responsibilities and finding our place in the pack (we await a study of dogs). Then, later, as we approach our fifties, after having scrambled to the top of the hill

that is life, we are able to stop for a while, reflect and take a breather. Suddenly, as we look out yonder, the future seems a little less unknown and daunting. We may be a little more gentle and accepting of things, including ourselves.

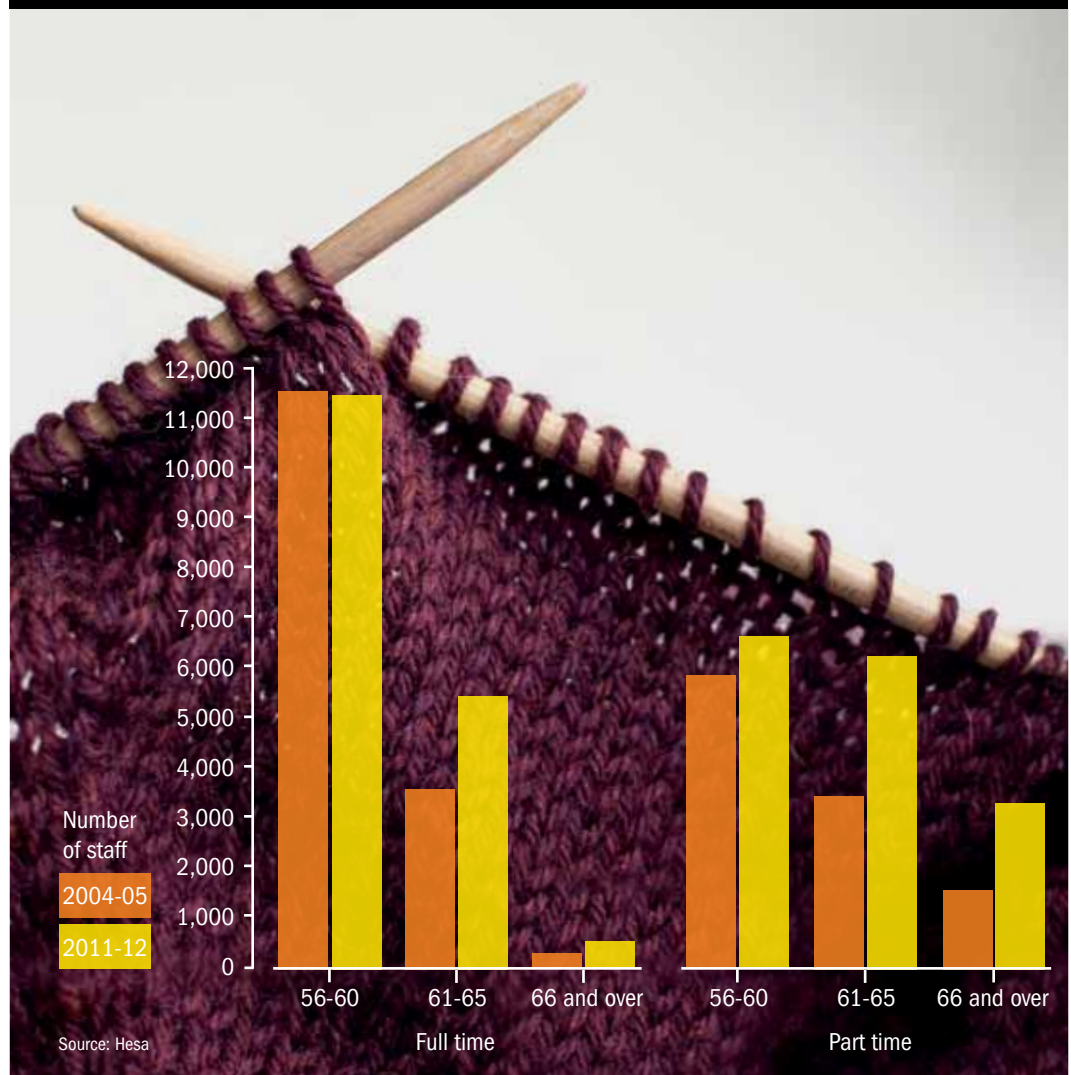
Of course, we all know individuals who seem to spend their whole life chasing success or, if one is feeling cruel, “proving themselves”, the insecure overachiever for whom the natural progression of maturity seems to have become arrested along the way. For them, a single Nobel prize or 1,000 journal articles will never suffice. While many academics will choose to continue whatever they like to do best, whether that is research or teaching, most usually evolve through the different stages of the academic life cycle, starting as a student and ending as a statesperson. As we move through these phases we develop different skills and are able to provide a slightly different service, but this is not always recognised by our employers. As the academic life cycle lengthens, it follows that universities will need to offer adequate provision to encourage us into new roles – and out of others.

So what can an academic institution do to support its employees in their lifelong drive towards success? One area that could be reformed is the academic evaluation and assessment system. In the UK, academics are currently assessed using the same performance targets and rewards in their later careers as they were subject to when they first entered the academy. Four articles are required every five or so years for the REF, and, to be deemed submissible by university managers, they need to be “internationally excellent” or better. The REF and its former incarnations have allowed university leaders a greater say over academics’ research performance and have given the government greater say over how it allocates its research funding. However, the evaluation process could be revamped to loosen control over more senior members of the academy to allow them more choice over their late-career pathway.

With flexibility in retirement age, universities find themselves in the tricky situation of having to incentivise their academic and professional staff into roles that benefit the institution but also, where appropriate, help them out of the university into retirement. If one looks at the relationship between teaching quality and age, Hamermesh believes that there will be greater pressure to “push” rather than “pull”. He points to two student projects carried out by his undergraduates at the University of Texas at Austin; the first showed a clear difference between the teaching scores of professors (on the same course) if they were under or over 70 years. Those under 70 years produced higher scores by about one standard deviation. In the second study, a student looked at professors’ student evaluations over time in a panel dataset. Hamermesh explains: “My student found that the average age of peak evaluations was 58 years.” Luckily for the student, Hamermesh was exactly that age when she submitted her piece of work.

But teaching and research are not the only factors. If an academic is a mentor for the

## MATURING PROCESS: CHANGING AGE PROFILE OF UK ACADEMICS



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young, an ambassador for the university, influences policy or commercial practice, sits on the governing councils of the research councils, or, importantly, is leadership material, all of this should be taken into consideration. Young academics are often promised a lighter teaching load to help them develop research (although this is not always a reality in practice). In a similar vein, academics who have been outstanding researchers could be incentivised to take on new roles later in their careers, safe in the knowledge that they will not be penalised for failing to produce the usual four articles.

If scholars are still doing top-rated research, raising funds and teaching adequately, then arguably they should be free to continue in work for as long as they wish. But some may need to adapt their roles to accommodate the institution’s wider needs. For those who have lost their touch or inspiration, university managers will need to facilitate a mutually agreed career exit. But universities must fully examine all of these options if they want to get the most out of their young, middle-aged and older academics and provide them with roles that are rewarding at every stage of their careers. ●

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