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Longitudinal studies workshop
About longitudinal studies

Professor Alison Park

Cardiff, 27 Nov 2017

MRC Medical Research Council

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

Today

- CLOSER
- About longitudinal studies
- Overview of findings
- Finding and accessing data
- Key resources

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About CLOSER

- **Objective**: to maximise the use, value and impact of the UK's longitudinal studies
- **Consortium**: 8 longitudinal studies, the British Library and the UK Data Service
- Funded by the ESRC and the MRC

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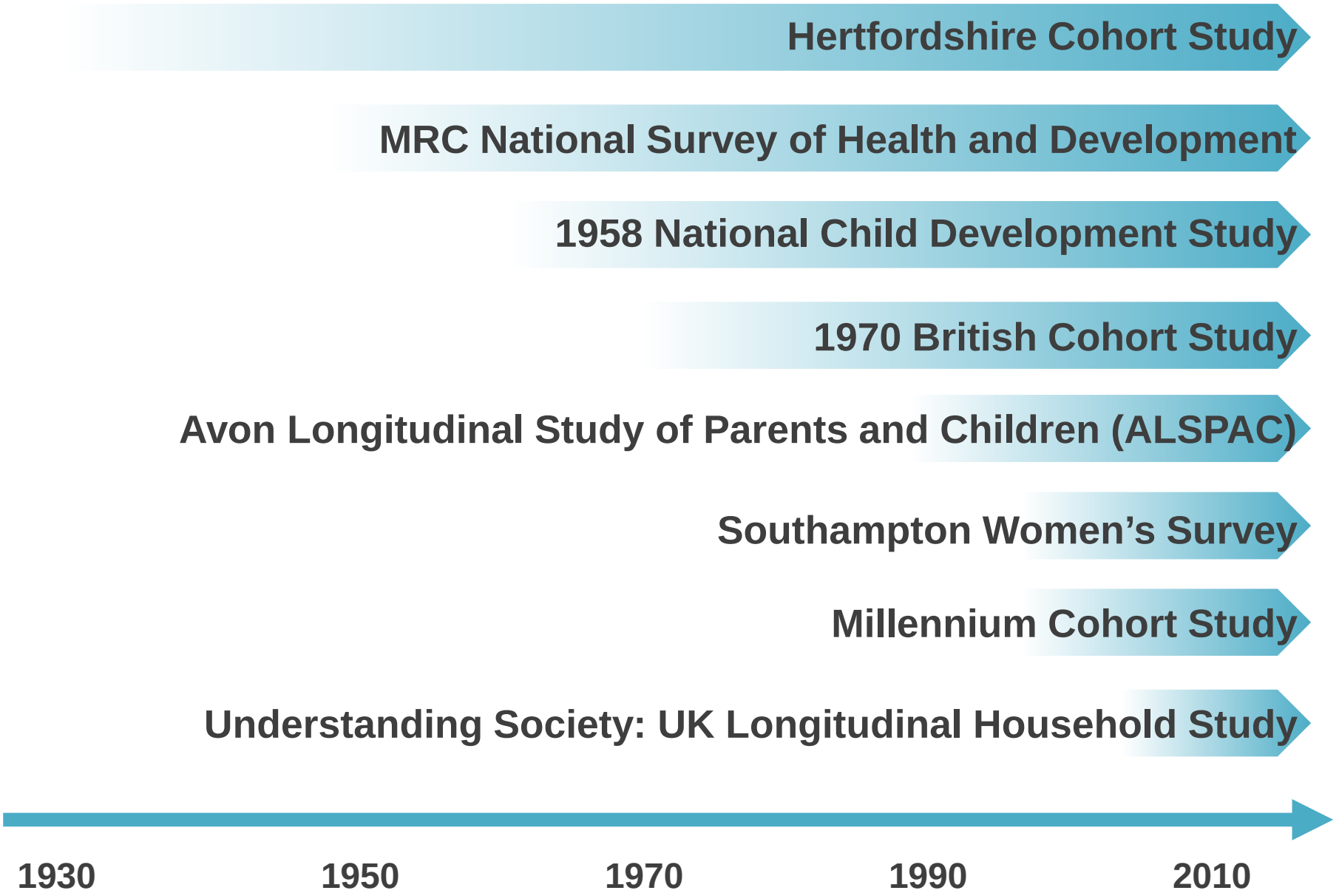
Hertfordshire Cohort Study
MRC National Survey of Health and Development
1958 National Child Development Study
1970 British Cohort Study
Avon Longitudinal Study of Parents and Children (ALSPAC)
Southampton Women's Survey
Millennium Cohort Study
Understanding Society: UK Longitudinal Household Study
1930
1950
1970
1990
2010

Key areas of CLOSER's work

- Research and guidance on data harmonisation and data linkage
- Data discovery
- Training and capacity building
- Promoting the value of longitudinal research

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About longitudinal studies

What they are, how they work, why we need them

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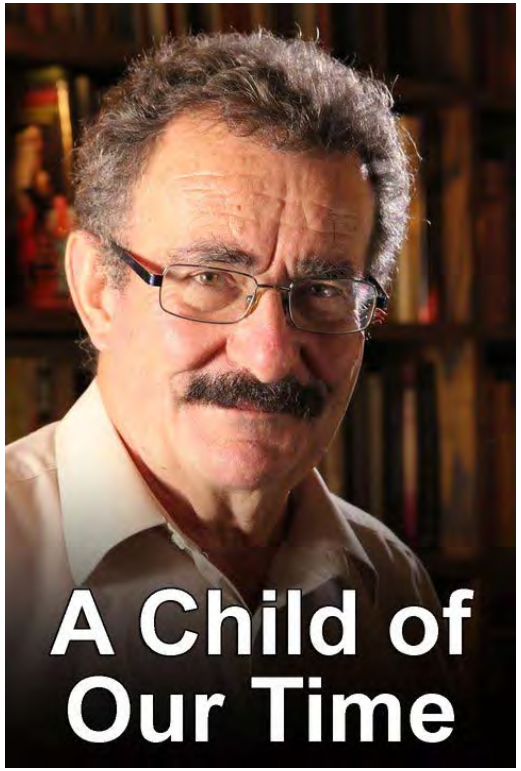
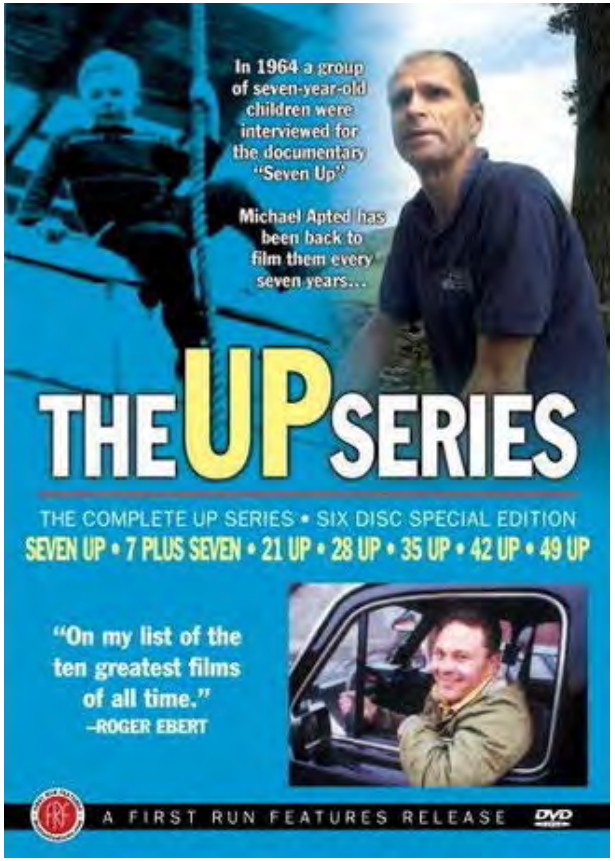
What is a longitudinal study?





What is a longitudinal study?

A longitudinal study is a prospective observational study that follows the same subjects repeatedly over a period of time

The UK is home to the largest and longest-running portfolio of longitudinal studies in the world

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Longitudinal vs cross-sectional

Cross-sectional	Longitudinal
One point in time	Several points in time
Different samples	Same sample
Snapshot of a given point in time, change at a societal level	Change at the individual level
Examples: Census, British Social Attitudes Survey	Examples: British Birth Cohort Studies, Understanding Society

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Types of longitudinal studies

- **Cohort studies**: follow groups of individuals with specific temporal boundaries
- **Household panel surveys**: follow households made up of groups of individuals
- **Record linkage studies**: follow individuals by linking their administrative records over time

Some key scientific questions longitudinal studies can address

1. Transmission of advantage and disadvantage between generations
2. Influence of early life circumstances
3. Individual change over time
4. Generational differences
5. Natural experiments and other methods for addressing causation vs association

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Data sources

- Study members at multiple age points
- Other key people in the study members' lives
- Wide array of information collected - cognitive assessments, clinical assessments, biological samples, event histories, time diaries, qualitative data
- Linkage to administrative records

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The 1958 British birth cohort

	1958 Birth	1965 7	1969 11	1974 16	1981 23	1991 33	2000 42	2003 45	2004 46	2008 50	2013 55
main respondent	mother	parents	parents	cohort member / parents	subject	subject	subject		subject	subject	subject
secondary respondent	medical	medical / school	medical / school	medical / school		partner mother children					
survey instruments		cognitive assess-ments	cognitive assess-ments	cognitive assess-ments						tests	
linked data				area of residence (census)	area of residence (census)						
response rate	17,415	15,425	15,337	14,654	12,537	11,469	11,419	9,377	9,534	9,790	9,137

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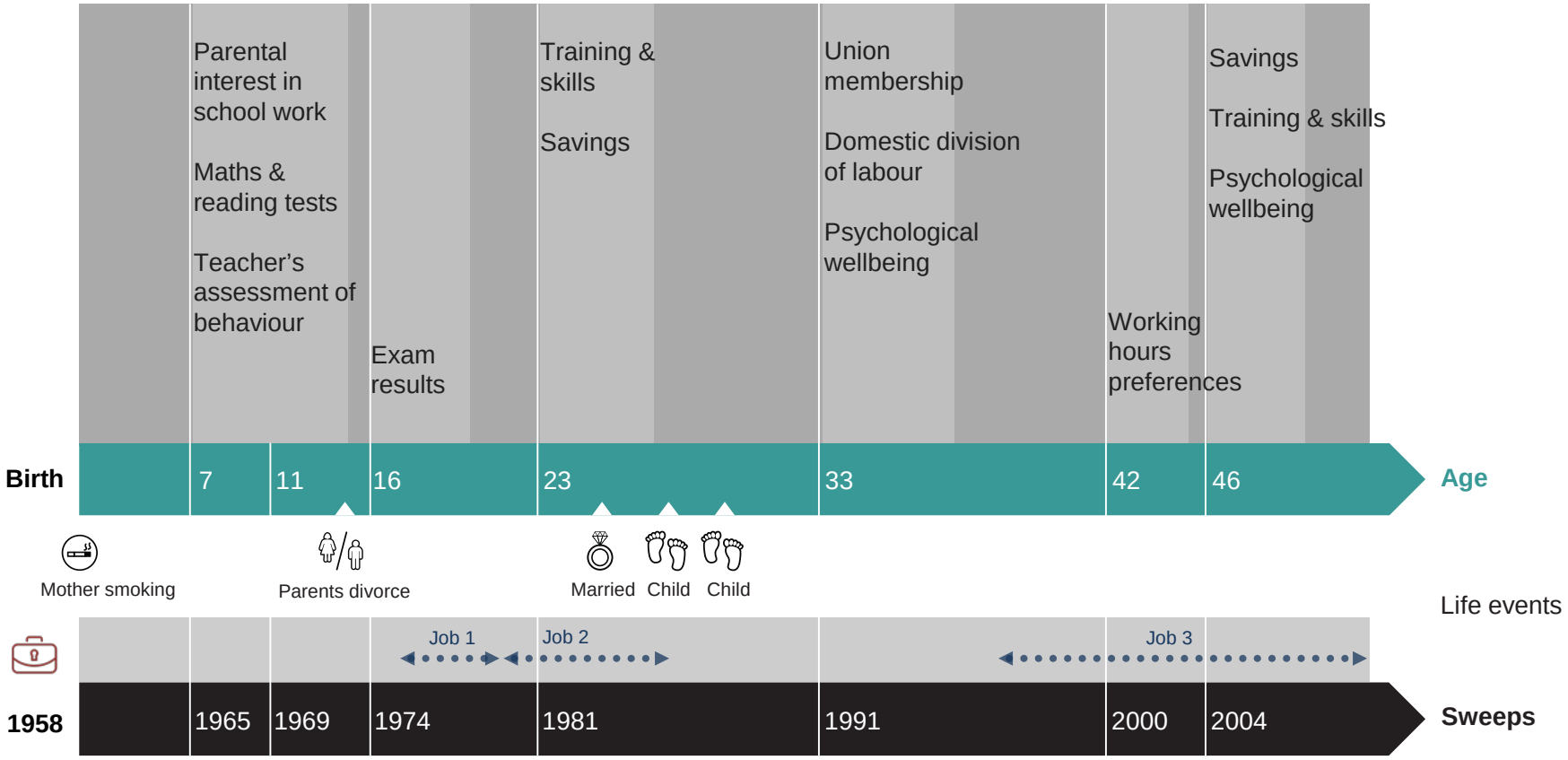
Hypothetical life history



Advantages

- Volume, detail and accuracy of information collected
- Data allow us to explore questions that can not be addressed with cross-sectional data (eg patterns of change and the dynamics of individual behaviour)
- Help us get closer to understanding causal effects

Establishing causality

- **Temporal order** – longitudinal studies help us determine the order in which events/experiences/changes occur
- **Controlling for related factors** – longitudinal studies allow us to control for a wide range of potential related factors, which can help us understand mechanisms and processes
- **Exploiting natural experiments** – using longitudinal data to take advantage of natural discontinuities
- **Statistical techniques** – to allow us to test whether relationships are likely to be causal

Disadvantages

- Samples shrink over time in a non-random manner random (attrition)
- Timeliness
- Complexity of the datasets
- Comparing one cohort to another (challenges of harmonisation)

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Questions?

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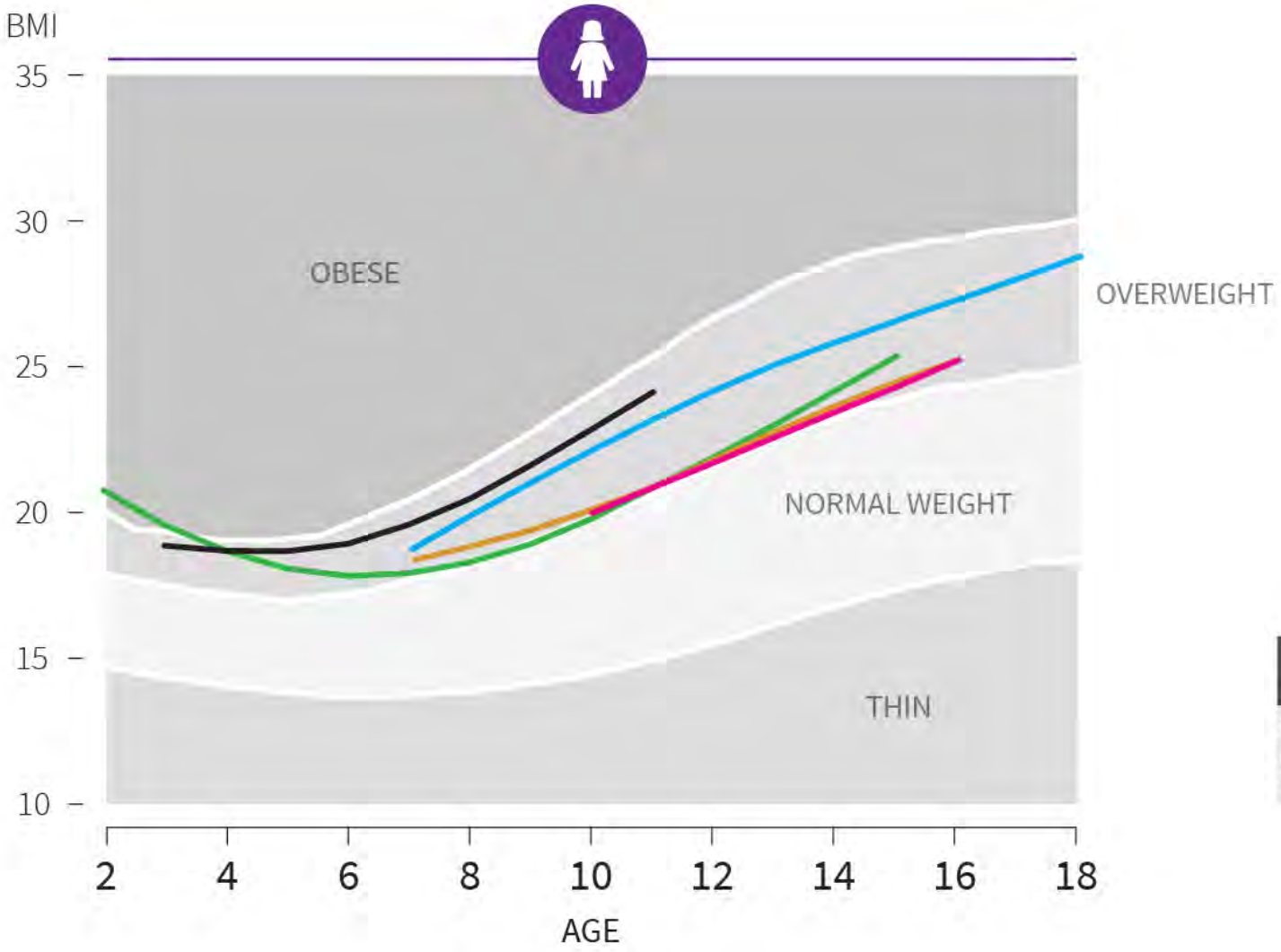

IOTF CUT-OFFS FOR GIRLS AGE 11	
OVERWEIGHT	21
OBESE	25
THIN	15

Some key findings

Examples of key findings from different longitudinal studies

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Some key scientific questions longitudinal studies can address

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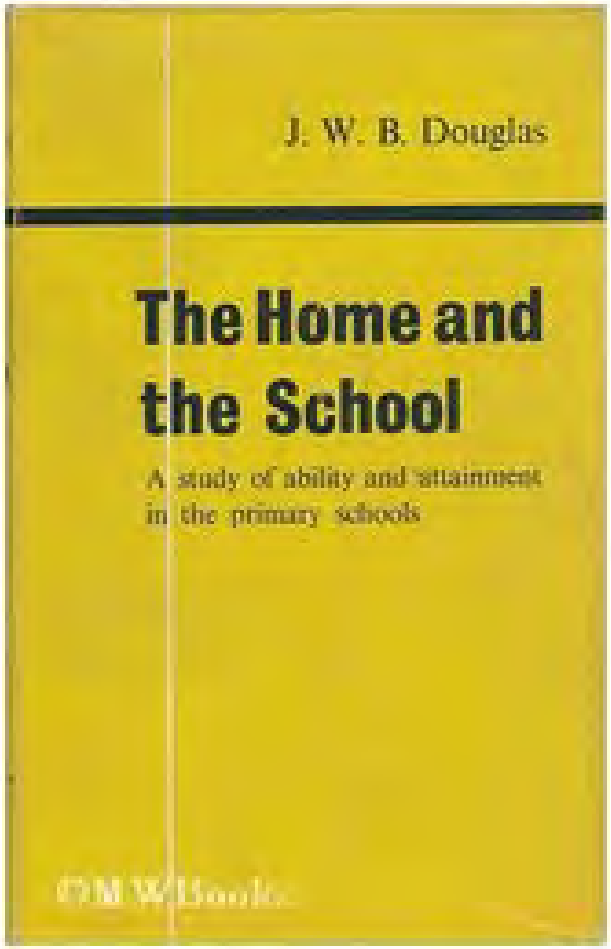
Intergenerational transmission of advantage & disadvantage



Grammar schools

Grammar schools 'could be fantastic for social mobility – if any poor kids went to them'

The evidence says grammar school students do better and more go on to university, but the challenge is getting bright children from poorer families to attend them

Sally Weale and Richard Adams

Saturday 17 October 2015 07.00 BST

An English lesson at Rugby High School for Girls. Photograph: John Robertson for the Guardian

Before they even arrive, and fathom out the school motto *Ascensiones in corde suo disposuit* (She has set heights in her heart), every girl at Rugby High School for Girls has sat and passed the 11-plus exam. Apart, that is, from the headteacher.

Intergenerational transmission of advantage & disadvantage

- Douglas (1964) used data from the 1946 cohort to identify socio-economic differences in grammar school attendance
- Feinstein (2003) & others identified substantial gaps in preschool attainment between children from different socio-economic backgrounds, which did not reduce as a result of schooling

- One in 4 children growing up in poverty in leave primary school unable to read well, and this gap begins in the early years
- Report identifies four sets of factors that shape language skills
- Analysis by WISERD of MCS Welsh data

READY TO READ

Closing the gap in early language skills
so that every child in Wales can read well

READ ON GET ON

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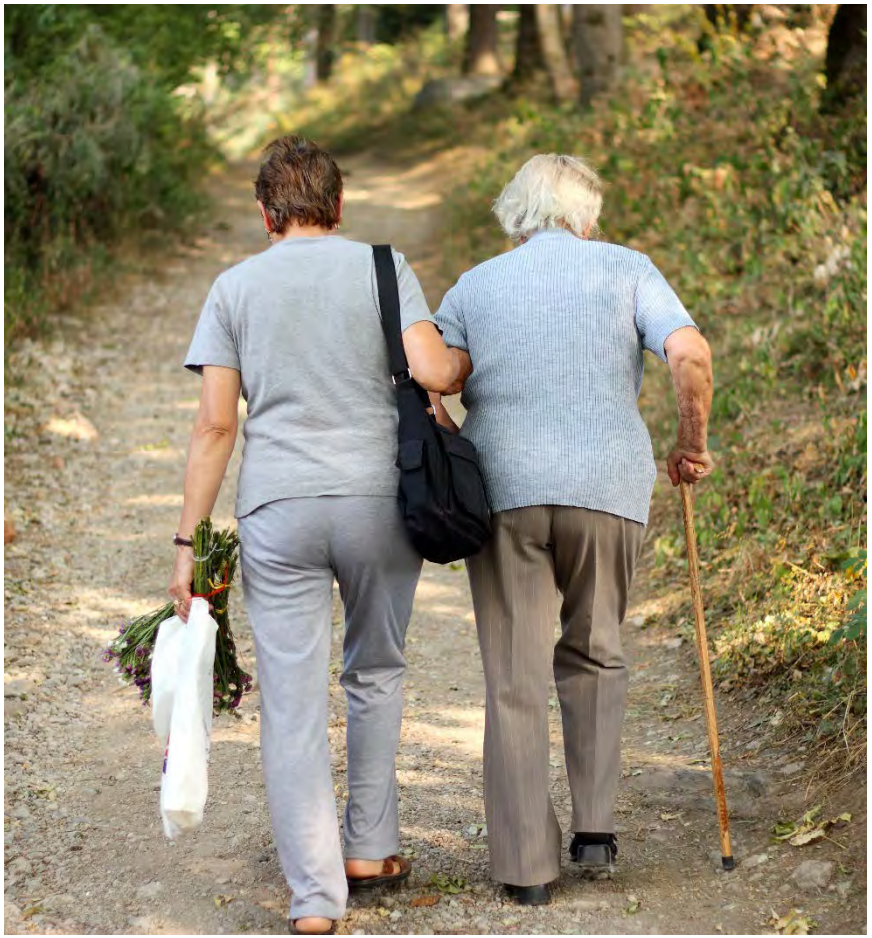
Influence of early life

- NCDS data showed smoking in pregnancy linked to lower birth weight & higher rates of foetal/neonatal death
- Subsequent findings on long-term outcome of exposure to smoking in pregnancy

Influence of early life

- Physical capability = everyday physical tasks like standing up, grip strength
- Socioeconomic circumstances at age 4 associated with lower overall physical capability at 53



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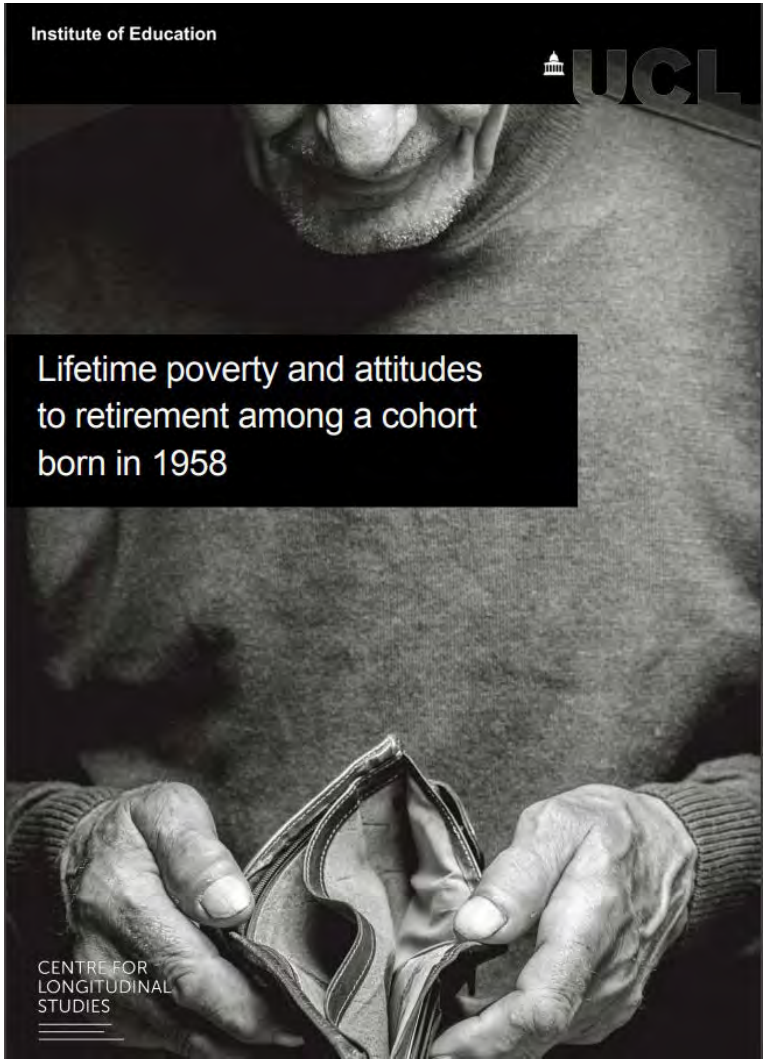
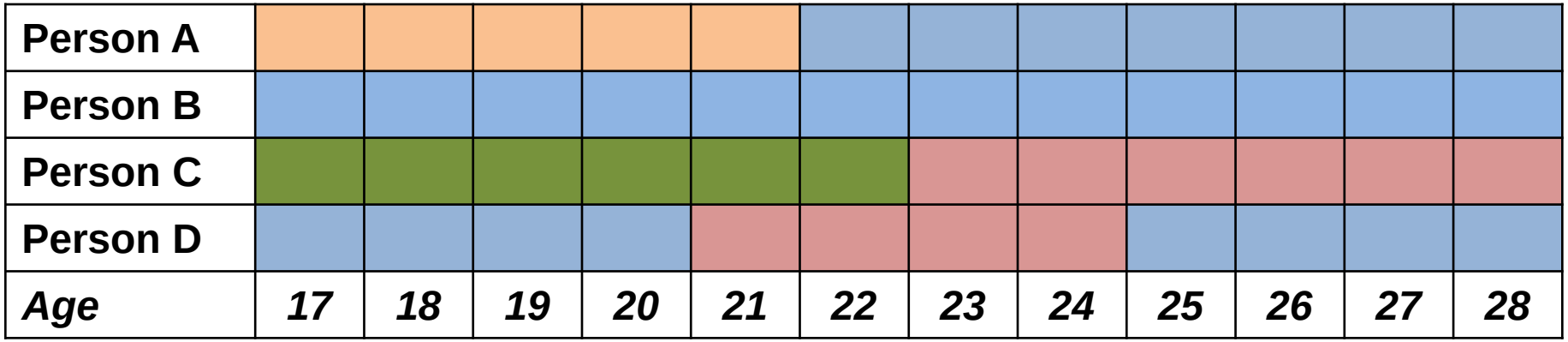
Individual change over time

- Exploring plans for retirement among generation born in 1958, using NCDS data
- Interest in working patterns among different income groups, and their implications for retirement



Individual change over time



Full time employment

Part time employment

Education

Unemployed

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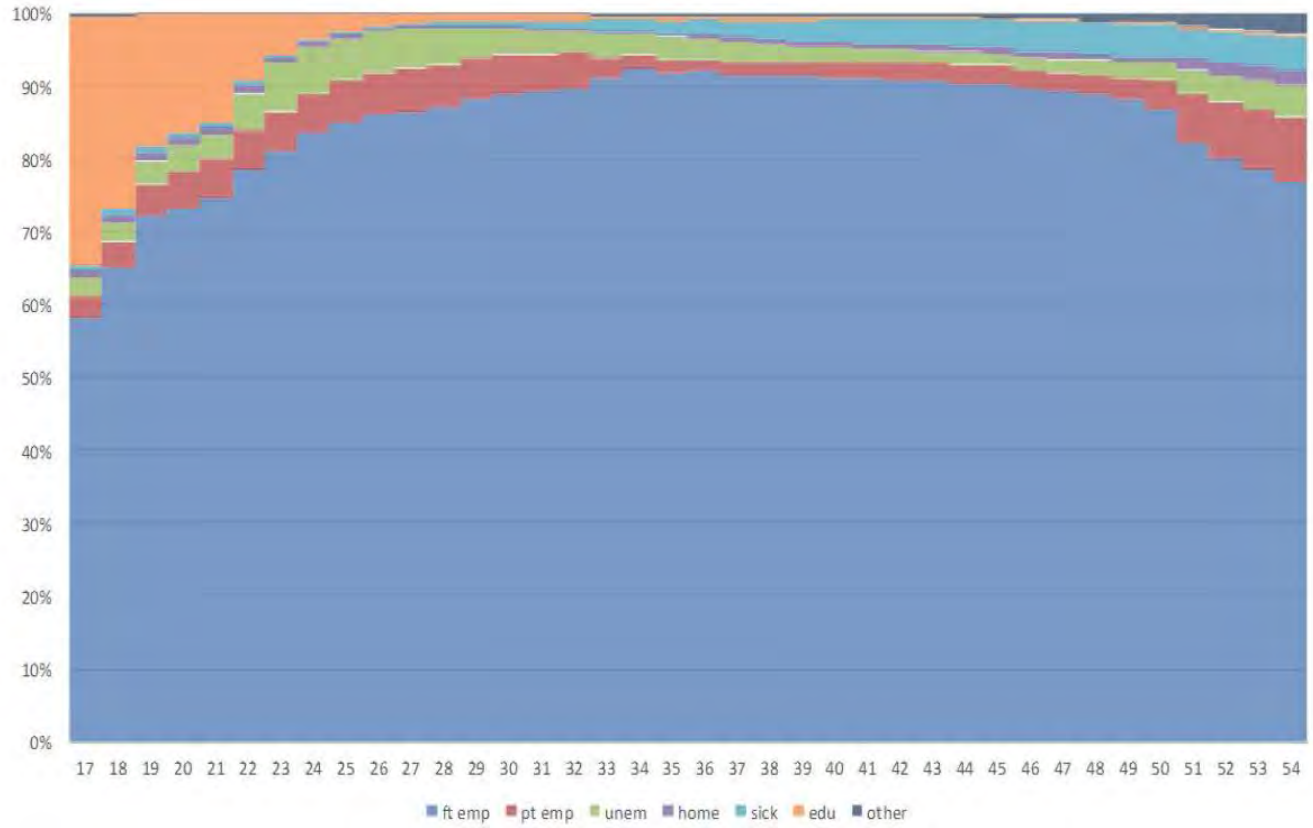
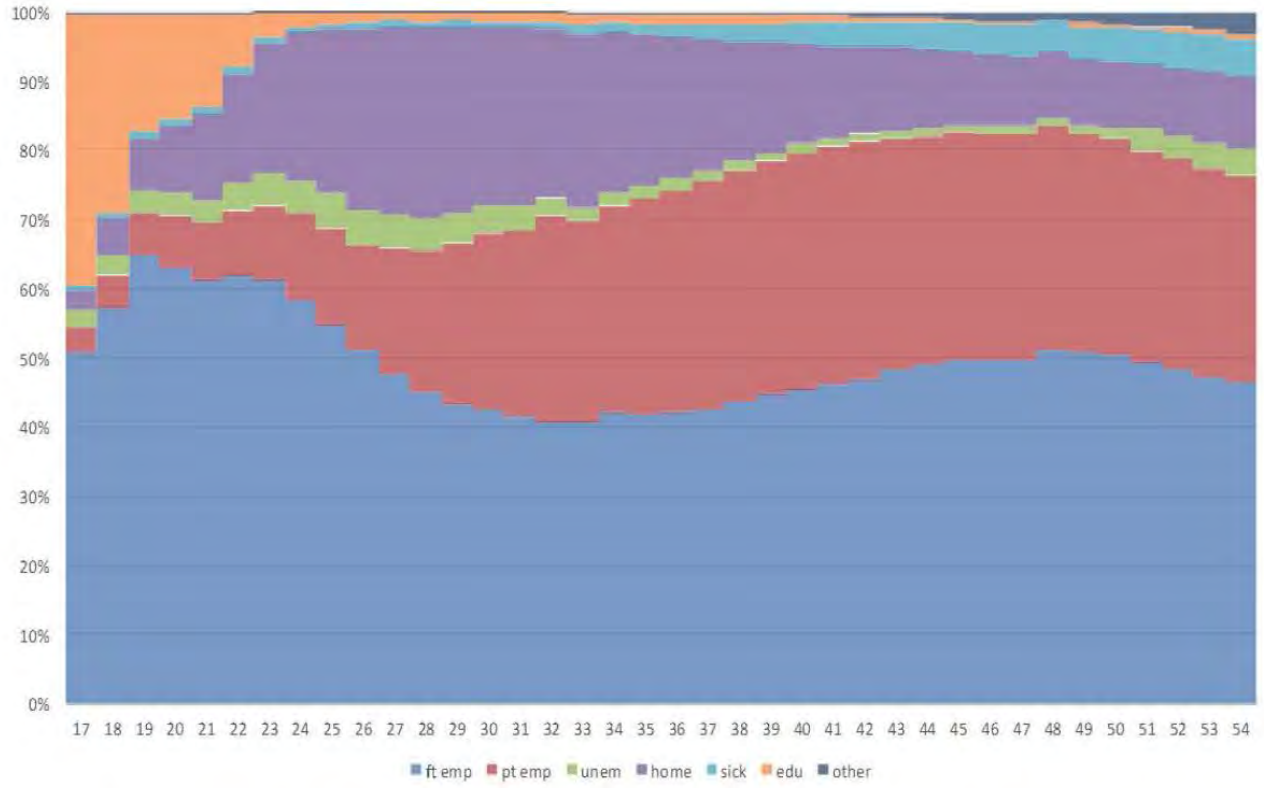
Individual change over time

Figure 3.1: Working life histories for men: economic activity at ages 17-54 (January 1975 to December 2012)



Individual change over time

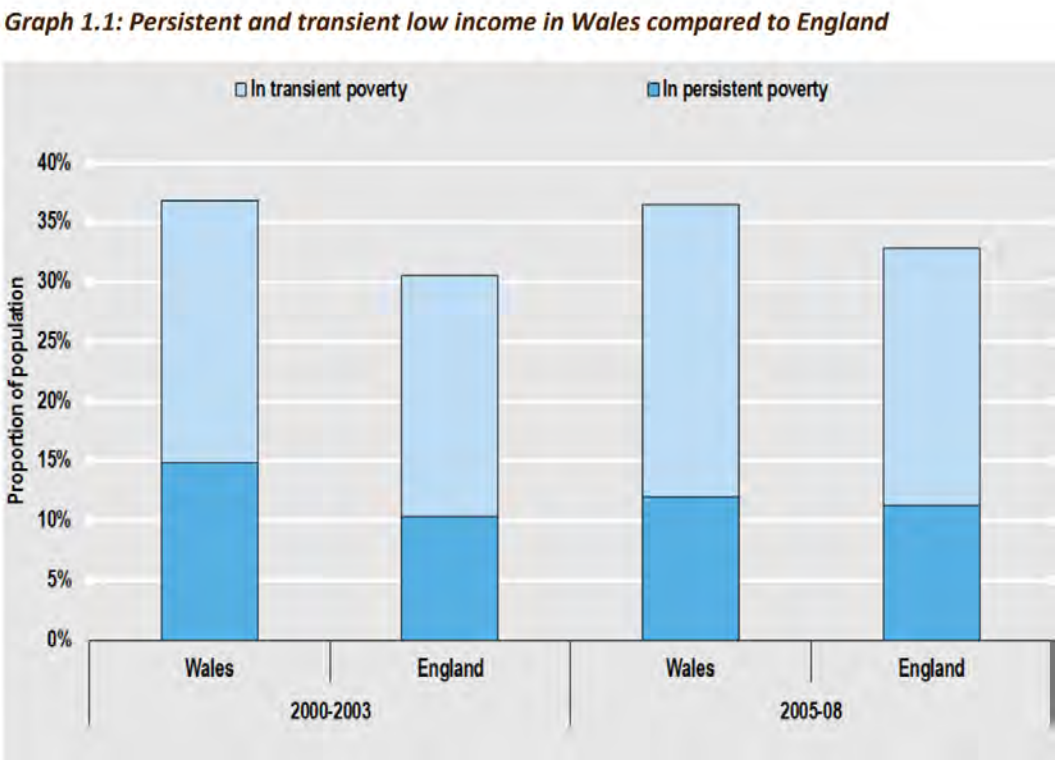
Figure 3.2: Working life histories for women: economic activity at ages 17-54 (January 1975 to December 2012)



Individual change over time

New Policy Institute report, ‘Dynamics of low income’ (2014), based on BHPS data

Interest in exploring ‘persistent’ & ‘transient’ poverty, and difference between England and Wales



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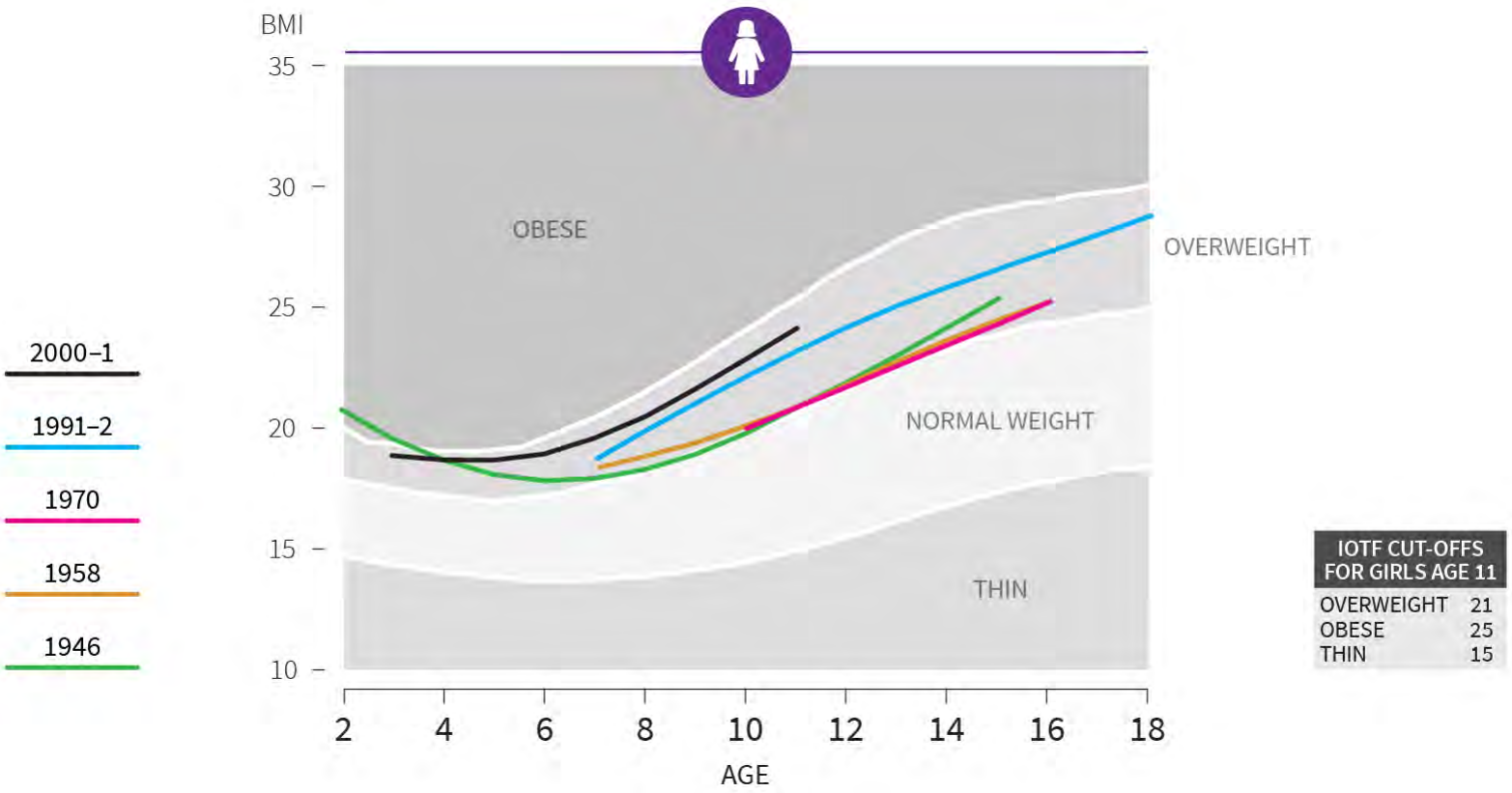
Generational differences

- Hardy et al (2016) analysed information on the height, weight and body mass index (BMI) of 56,632 people born in the UK from 1946 to 2001
- Children born since 1990 are up to three times more likely than older generations to be overweight or obese by age 10.
- Requires ‘harmonisation’ of data to allow comparisons to be made between studies.

Generational differences



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Natural experiments

Contents lists available at ScienceDirect

Journal of Environmental Psychology

journal homepage: www.elsevier.com/locate/jep

The Welsh Single-Use Carrier Bag Charge and behavioural spillover

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ARTICLE INFO

Article history:
Received 9 March 2016
Received in revised form
20 May 2016
Accepted 21 May 2016
Available online 24 May 2016

Keywords:
Spillover
Carrier Bag Charge
Behaviour
Attitudes
Policy
Sustainability

ABSTRACT

A Single-Use Carrier Bag Charge (SUCBC) requires bags to be sold for a small fee, instead of free of charge. SUCBCs may produce 'spillover' effects, where other pro-environmental attitudes and behaviours could increase or decrease. We investigate the 2011 Welsh SUCBC, and whether spillover occurs in other behaviours and attitudes. Using the Understanding Society Survey (n = 17,636), results show that use of own shopping bags increased in Wales, compared to England and Scotland. Increased use of own bags was linked to increases in six other sustainable behaviours, although changes were significantly smaller in Wales for three of these behaviours. Increased own bag use was linked to stronger environmental views, but effects were weaker in Wales for two out of three measures. We conclude that the Welsh SUCBC effectively encouraged bag re-use, but with minimal changes in other environmental attitudes and behaviours, due to the external motivation to change behaviour.

Natural experiments

Focus on behaviour pre & post introduction of plastic bag charge

Able to compare with England (no charge)

Found only small impact on other pro-environmental behaviours

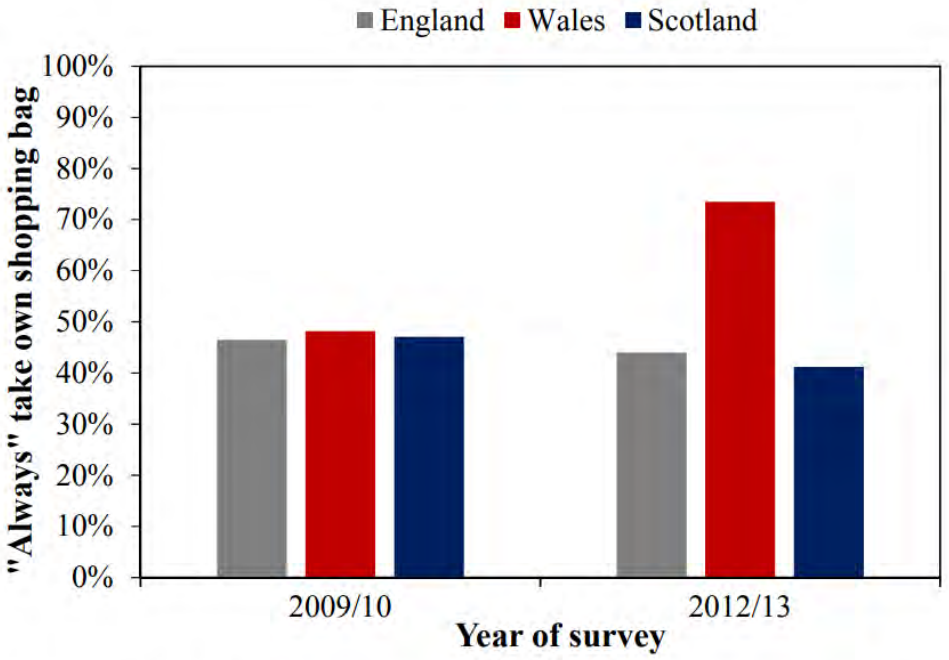


Fig. 2. Proportion of respondents who "always" bring their own shopping at Wave 1 and 4 for Wales, England and Scotland.

Faster broadband: are there any educational benefits?

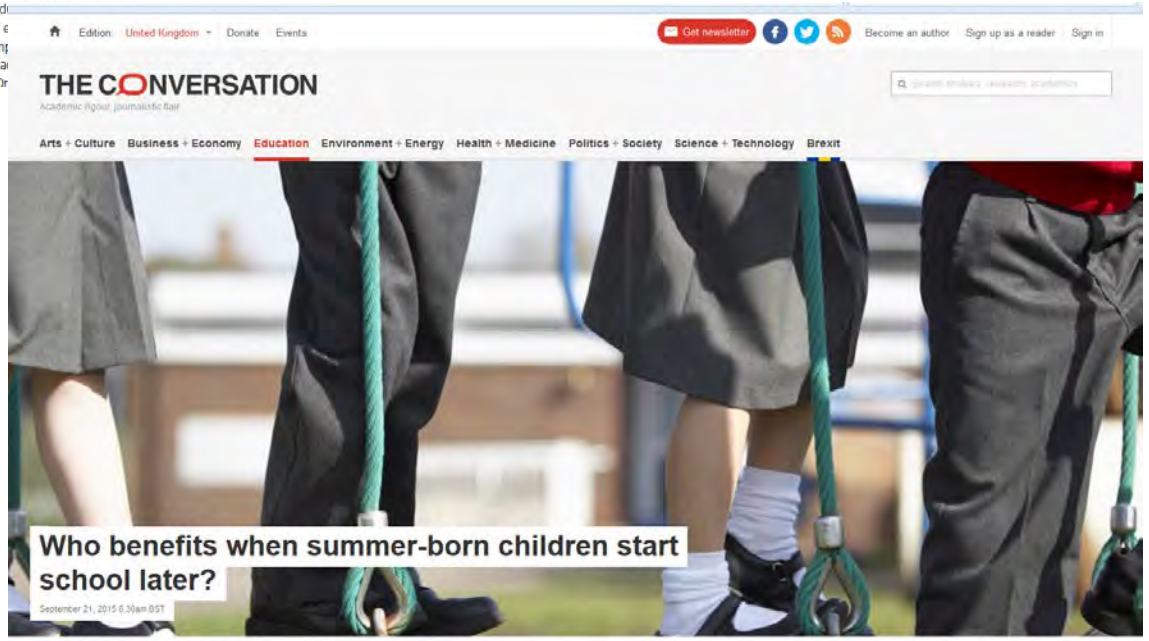
The UK government is investing over £1 billion in providing superfast internet coverage to 95% of the country by 2017.[1] Both the European Union and the United States have similarly ambitious plans to increase public access to broadband services providing download speeds of 30Mbps or higher.

These policies are partly motivated by claims that broadband upgrades will have positive effects on the economy and people's lives, ranging from higher productivity to more flexible working schedules. They also emphasise a supposed link between broadband upgrades and educational achievement in light of both the large amounts of time videos and downloading music – require fast connections. But it is an open question whether upgrading the available information and communication technologies (ICT) increases learning productivity or whether it leads to distractions that could in principle have negative effects on learning outcomes.

Despite its importance for policy, evidence on the impact of ICT on educational attainment is scarce since it is difficult to establish a causal connection. For example, richer households can afford faster internet packages and better ICT equipment; at the same time, young people from wealthy backgrounds generally attend good schools and perform better in national exams. We would then observe a positive correlation between home ICT and educational achievement without necessarily implying causality.

Our research combines a rich collection of micro-data with a new empirical approach to provide such causal evidence. Our main result is that even large changes in connection speeds have no effect on educational attainment or on time spent studying online or offline.

To understand the relationship between ICT and ed
we decompose the e
mechanisms: the imp
hours; and the impa
hour productivity. Or



Expectant parents in England with a September due-date will no longer have to hope that their baby doesn't arrive too early. The UK schools minister Nick Gibb recently announced that he will amend the school admissions code to clarify that no child will be forced to start school when they have just turned four.

His changes make clear that summer-born children (whose birthdays fall between April 1 and August 31) have the right to begin reception in the September following their fifth birthday – rather than being required to start the previous year, at four.

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PhD student, UCL

Disclosure statement

Tammy Campbell receives PhD funding from the Economic and Social Research Council.

Questions?

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References

- Butler, Goldstein and Ross (1972), ‘Cigarette smoking in pregnancy: its influence on birth weight and perinatal mortality’, BMJ.
- Carpentieri et al (2017), Lifetime poverty and attitudes to retirement among a cohort born in 1958, Centre for Longitudinal Studies.
- Douglas (1964), The home and the school, Panther Books.
- Feinstein (2003), ‘Inequality in the early cognitive development of British children in the 1970 cohort’, Economica.
- Guralnik, Butterworth, Wadsworth et al (2006), ‘Physical functioning half a century later’, Journals of Gerontology.
- Johnson et al (2015). How Has the Age-Related Process of Overweight or Obesity Development Changed over Time? Co-ordinated Analyses of Individual Participant Data from Five United Kingdom Birth Cohorts. PLOS Medicine, e1001828.
- New Policy Institute (2014), The dynamics of low income, Welsh Government Social Research
- Read on, Get on (2015), Ready to Read, Save the Children.
- Thomas et al (2016), ‘The Welsh Single-Use Carrier Bag Charge and behavioural spillover’, Journal of Environmental Psychology.