Aberdeen Children of the 1950s

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Abstract

Aberdeen Children of the 1950s started in 1962 as a survey of children born in the city between 1950-56 (n=12,150). The cohort is of a similar size and era to the 1946 and 1958 UK cohorts, but location-specific like the Hereford cohort. Revitalised in 1998, 97% of the participants were traced, with 81% still living in Scotland. Two-thirds answered a wide-ranging postal questionnaire, and those in Scotland were linked to medical records. Since then, the study has been a well-used resource, with 38 publications. Key results have come from linkage of pregnancy and neonatal data across three generations, demonstrating the importance of intergenerational factors on health. Other notable results include the analysis of influences on childhood intelligence, and the correlation of childhood intelligence with social and health outcomes in later life.

The Aberdeen Children of the 1950s study is unique for its multi-level early-life data. For each participant, data were gathered on: reading and maths skills; cognitive ability; school medical records; teachers' behavioural assessments; peer questionnaires; and mothers' obstetric records. Siblings were grouped into families; 2320 of 9422 families had more than one child in the study. 27% of parents gave an in-depth interview on social, economic, demographic, and health topics. Individuals were also grouped into both neighbourhoods and school districts, with each linked to census data.

The cohort grew up during an important era in Aberdeen. They were born into a depressed city with high emigration and poor housing, but with the discovery of North Sea oil in the 1970s, now live in a prosperous, multinational industrial city. Re-engagement with the cohort is underway, with the goal of establishing the study as a platform for future research as the cohort ages. All participants will be contacted in 2015, and a set of large engagement events will allow participants to come and discuss science and the project's shape moving forward. The strengths of the Aberdeen Children of the 1950s study are the inclusion of almost all of the children born in the city, and the diverse, multi-level administrative data available. A cross-study comparison of the relation of early-life history to later health and well-being would be particularly valuable.

Data and Linkages

1962

all 14,939 children
7 to 11 years old
attending primary school
in Aberdeen

12,150 (81%) born
in Aberdeen and in the
Aberdeen Maternity and
Neonatal Database

9,422 families represented
5,048 have sibling in study
136 twin pairs

2,510 (27%) in-home
parent interviews

Links made

- Reading, maths, reasoning scores
- Social studies and science scores
- IQ scores at 7, 9 and 11 years old
- Behavioural assessments
- Student-reported peer group
- School medical record
- Teachers' report of best in class
- Mothers' maternity records
- Mothers' socioeconomic history
- Siblings in study
- School-level academic performance
- School-level sociodemographics
- Neighbourhood sociodemographics
- Family interview: parents' ages, schooling, occupations, hours worked, marital history, reproductive history, involvement with school, opinions on childhood independence, corporal punishment, sex education, religion education; child's medical and dental history; food likes and intolerances; homework time; behavioural problems; house's occupancy, rooms, sanitary facilities, cooking facilities; family's friendships, clubs, hobbies, church denomination and frequency, newspapers, magazines, comics, TV programmes, library use, continuing education, trade unions, politics

2001

11,827 (97%) traced
72% remain in Grampian

7,183 (65%) complete
postal questionnaire

addition of 7,080 children
born to women
in the cohort

- Acute Hospital Admissions (SMR01)
- Psychiatric Admissions (SMR04)
- Cancer (SMR06)
- Maternity (SMR02 and AMND)
- Questionnaire: height, weight, illnesses, disabilities, mental health, own and mother's reproductive history, menarche and menopausal history, drinking and smoking history, parents' ages, parents' occupations, childhood and current homes' characteristics, car usage, schools attended, education qualifications, marital history, occupation, salary

2010s

500 (4%) and their families
join Generation Scotland
and Stratifying Resilience
and Depression
Longitudinally (STRADL)

- Demographics; lifestyle, personal and family medical history
- Physical characteristics
- Cognitive function
- Mental health
- Blood biochemistry
- Genotype
- MRI

Results

In the fifteen years since the study was restarted, researchers have used the Aberdeen Children of the 1950s data in 38 projects. Most projects have sought to answer questions on health and intelligence, with a focus on using the extensive neonatal records available for the cohort through the Aberdeen Maternity database. These projects have discovered how birth weight is related to developing heart disease, how childhood weight is related to developing diabetes, and how childhood intelligence are related to the risk of early death. References for all published studies using the cohort data are available on the website.

The wealth of social, demographic and economic data in the Aberdeen Children of the 1950s study remains ripe for exploration. There are extensive multi-level data on each child, their family, their classroom, their peer network, the characteristics of both their school and their home neighbourhoods in both early life and middle age.

Current Research

This year, the focus of the Aberdeen Children of the 1950s study is a set of member engagement activities. We have recruited a participant panel, started online social communities, and are hosting a reunion at the University this winter (see right). The goal of these activities is to renew the connection with the members, involving them in the design and management of the studies, and laying the foundation for recruiting in the future.

We are also recruiting volunteers from the study to record the histories of their lives. The goal of this project is to create a resource for researchers using the study by giving context to the data, and identifying the members' ideas for the important areas for future research.

One the long-term goals for the study is to discover how members have been able to adapt after times of adversity. This project on resilience will involve using the rich socioeconomic data currently available, and linking data from the Aberdeen Children of the 1950s to a variety of other sources like industry records, census data, social welfare data, and the Oral Histories project.

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ASSOCIATIONS BETWEEN BIRTH WEIGHT AND BONE MICROARCHITECTURE IN THE RADIUS AND TIBIA OF OLDER ADULTS FROM THE HERTFORDSHIRE COHORT STUDY

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Background

•Evidence is accruing that environmental factors in early life have a critical influence on the magnitude of peak bone mass achieved, and on later risk of fracture.

•To date, no studies have investigated the relationship between birth weight and bone microarchitecture in human populations.

•High resolution peripheral quantitative computed tomography (HRpQCT) scanners permit the non-invasive assessment of cortical and trabecular structure.

•We used HRpQCT to investigate the relationship between birth weight and bone macro- and micro- architecture and volumetric BMD (vBMD) in older age in the Hertfordshire Cohort Study.

Material and Methods

•198 men and 178 women born between 1931 and 1939 were studied. Birth weight was obtained from birth records. Ages at the time of scanning ranged from 72.1 to 81.4 years.

•HRpQCT images (voxel size 82μm) of the non-dominant distal radius and tibia were acquired with an Xtreme scanner (Scanco Medical).

•Standard morphological analysis was performed for assessment of macrostructure, vBMD, cortical porosity and trabecular microarchitecture.

•Anthropometric measurements were taken and information on demographics, lifestyle, and comorbidities were obtained from study questionnaires.

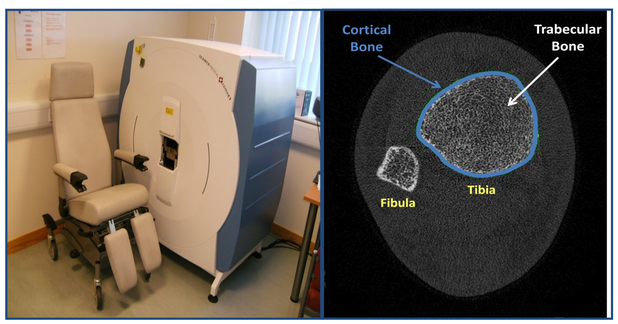

Figure 1: Scanco Xtreme HRpQCT scanner

Results

•The mean (SD) age of participants was 76.1 (2.5) and 76.5 (2.6) years in men and women respectively.

•There was a positive association between birth weight and bone area (total and trabecular) in men and women at both the radius and tibia ($p<0.05$).

•In women, birth weight was negatively associated with trabecular BMD (β (95%CI) radius -16.8 (-29.4,-4.2), tibia -12.5 (-24.3,-0.8) mg/cm^3/kg) and trabecular thickness (β(95%CI) radius -3.47 (-6.63-0.32), tibia -6.09 (-9.56,-2.63) μm/kg) ($p<0.05$ for all).

•These associations were generally robust to adjustment for adult size. There was no evidence of an association between birth weight and cortical area, vBMD or porosity in either sex.

Birth weight (SD)		Unadjusted β (95% CI)	p	Adjusted[1] β (95% CI)	p
Total area (mm^2)	R	**12.97 (2.66,23.27)**	**0.014**	**13.59 (2.62,24.55)**	**0.015**
	T	**28.93 (9.92,47.95)**	**0.003**	**35.23 (15.40,55.06)**	**0.001**
Trabecular area (mm^2)	R	**11.09 (1.16,21.02)**	**0.029**	**12.58 (2.03,23.14)**	**0.020**
	T	**25.29 (5.62,44.96)**	**0.012**	**31.72 (11.37,52.07)**	**0.002**
Cortical area (mm^2)	R	1.68 (-0.22,3.58)	0.082	1.36 (-0.60,3.32)	0.173
	T	3.34 (-0.35,7.02)	0.076	2.61 (-1.00,6.23)	0.155
Cortical thickness (μm)	R	11.92 (-14.44,38.28)	0.373	8.66 (-18.54,35.86)	0.530
	T	11.34 (-23.78,46.45)	0.525	0.07 (-35.09,35.24)	0.997
Cortical density (mg/cm^3)	R	-1.95 (-8.81,4.92)	0.577	-0.24 (-7.37,6.89)	0.947
	T	-0.71 (-9.03,7.62)	0.867	-0.07 (-8.76,8.62)	0.987
Cortical porosity (%)	R	0.14 (-0.05,0.34)	0.153	0.07 (-0.12,0.26)	0.467
	T	0.16 (-0.21,0.52)	0.390	0.08 (-0.29,0.45)	0.665
Trabecular density (mg/cm^3)	R	0.02 (-5.05,5.10)	0.992	0.78 (-4.49,6.04)	0.771
	T	-0.80 (-5.49,3.89)	0.736	-0.05 (-4.81,4.71)	0.984
Trabecular number (cm^{-1})	R	0.20 (-0.14,0.54)	0.243	0.22 (-0.12,0.57)	0.205
	T	0.19 (-0.23,0.61)	0.377	0.18 (-0.20,0.56)	0.355
Trabecular Thickness (μm)	R	-0.30 (-1.70,1.11)	0.678	-0.05 (-1.52,1.42)	0.947
	T	-0.71 (-2.03,0.61)	0.292	-0.46 (-1.84,0.93)	0.517
Trabecular seperation (μm)	R	-4.29 (-12.63,4.05)	0.312	-5.45 (-14.20,3.29)	0.220
	T	-2.45 (-9.91,5.01)	0.518	-2.78 (-9.83,4.28)	0.438

Table 1: Associations between standardised birth weight and tibial and radial bone microstructure in men

Birth weight (SD)		Unadjusted β (95% CI)	p	Adjusted[1] β (95% CI)	p
Total area (mm^2)	R	**7.53 (0.61,14.45)**	**0.033**	**8.40 (0.80,16.01)**	**0.031**
	T	**30.77 (15.12,46.43)**	**<0.001**	**34.60 (17.99,51.22)**	**<0.001**
Trabecular area (mm^2)	R	**7.71 (0.58,14.84)**	**0.034**	**9.06 (1.23,16.89)**	**0.024**
	T	**32.71 (16.13,49.28)**	**<0.001**	**37.80 (20.25,55.3)**	**<0.001**
Cortical area (mm^2)	R	-0.37 (-1.72,0.99)	0.595	-0.96 (-2.40,0.49)	0.193
	T	-0.86 (-3.44,1.72)	0.510	-2.25 (-4.86,0.36)	0.090
Cortical thickness (μm)	R	-15.89 (-42.18,10.40)	0.234	-26.70 (-55.37,1.97)	0.068
	T	**-35.94 (-65.92,-5.95)**	**0.019**	**-51.27 (-82.87,-19.66)**	**0.002**
Cortical density (mg/cm^3)	R	-0.10 (-9.56,9.36)	0.983	-1.26 (-11.76,9.23)	0.812
	T	-6.90 (-16.99,3.20)	0.179	-9.30 (-20.26,1.66)	0.096
Cortical porosity (%)	R	-0.14 (-0.36,0.09)	0.224	-0.20 (-0.44,0.05)	0.117
	T	-0.00 (-0.41,0.41)	0.999	-0.07 (-0.53,0.39)	0.753
Trabecular density (mg/cm^3)	R	**-8.91 (-15.59,-2.23)**	**0.009**	**-11.86 (-18.76,-4.96)**	**0.001**
	T	**-6.65 (-12.90,-0.41)**	**0.037**	**-8.25 (-14.92,-1.59)**	**0.015**
Trabecular number (cm^{-1})	R	-0.59 (-1.25,0.07)	0.077	**-0.96 (-1.63,-0.29)**	**0.005**
	T	0.39 (-0.17,0.95)	0.176	0.34 (-0.23,0.91)	0.236
Trabecular Thickness (μm)	R	**-1.84 (-3.52,-0.17)**	**0.031**	**-2.18 (-4.02,-0.33)**	**0.021**
	T	**-3.23 (-5.07,-1.39)**	**0.001**	**-3.82 (-5.83,-1.82)**	**<0.001**
Trabecular seperation (μm)	R	**24.27 (1.09,47.44)**	**0.040**	**37.92 (13.92,61.93)**	**0.002**
	T	-4.21 (-17.88,9.47)	0.545	-4.01 (-18.38,10.36)	0.582

Table 2: Associations between standardised birth weight and tibial and radial bone microstructure in women

1: Covariates are age, BMI, smoking status, alcohol consumption, calcium intake, physical activity, and social class. R, radius. T, tibia.

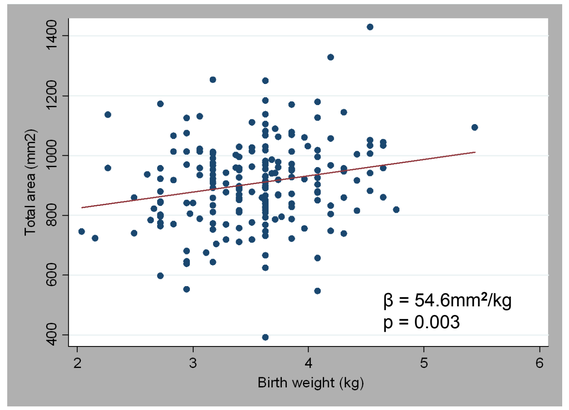

Figure 2: Scatter plot showing association between birth weight and tibial total area in men

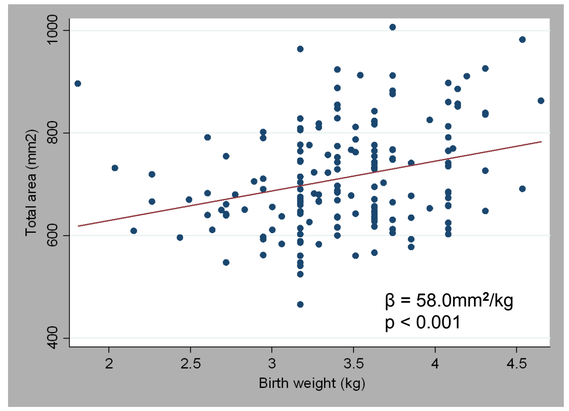

Figure 3: Scatter plot showing association between birth weight and tibial total area in women

Conclusions

•In summary, we have observed relationships between early life and bone area in both men and women in their eight decade.

•Associations between birth weight and trabecular architecture were identified in women and these may suggest an estrogen dependent effect.

•Further work in larger groups is indicated to reproduce these findings, and to relate their significance to fracture incidence.

Clinical and social outcomes of adolescent self-harm: population based birth cohort study

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Background

Self-harm is an important public health concern in adolescents, with community studies reporting a lifetime prevalence of 13-18% [1-3].

Little is known about the longer-term relevance of adolescent self-harm for outcomes in early adulthood. Existing follow-up studies have typically been conducted in small clinical samples [4-6] however, most episodes of self-harm do not present to services [2-3].

The few longitudinal population studies have focused on suicidal self-harm (suicide attempts) and have found associations with a range of adverse outcomes in adulthood [7-8]. However, suicide attempts comprise a relatively small proportion of self-harm acts. The longer-term outcomes associated with non-suicidal self-harm are not known.

Objectives

To investigate the early-adult outcomes of adolescent self-harm in a general population sample, and examine whether these outcomes differ according to self-reported suicidal intent

Method

Sample: The Avon Longitudinal Study of Parents and Children (ALSPAC), a longitudinal population based birth-cohort [9]

4799 participants from the ALSPAC birth cohort provided data on self-harm with and without suicidal intent at age 16 years. Data were collected via a self-report postal questionnaire

Measures:
Exposure: Self-harm with and without suicidal intent (lifetime)

"Have you ever hurt yourself on purpose in any way (e.g. by taking an overdose of pills or by cutting yourself)?"

An additional two questions were used to distinguish between participants who had harmed with and without suicidal intent

Outcomes:

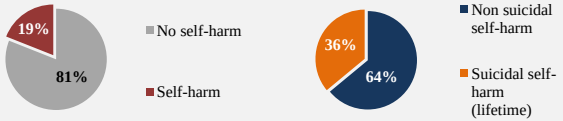
Mental health problems
- Depressive disorder (18 yrs)
- Anxiety disorder (18 yrs)
- Future self-harm (21 yrs)

Substance use problems
- Harmful Drinking (18 yrs)
- Problem cannabis use (18 yrs)
- Regular smoking (18 yrs)
- Illicit drug use (18 yrs)

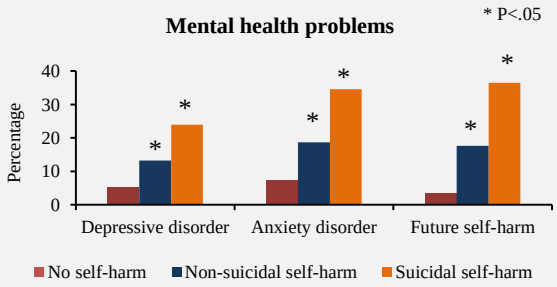
Educational/ occupational difficulties
- Did not achieve 5+ GCSEs (A*-C) (15-16 yrs)
- Did not achieve 3+ A levels (19 yrs)
- Not in education, employment, or training (19 yrs)

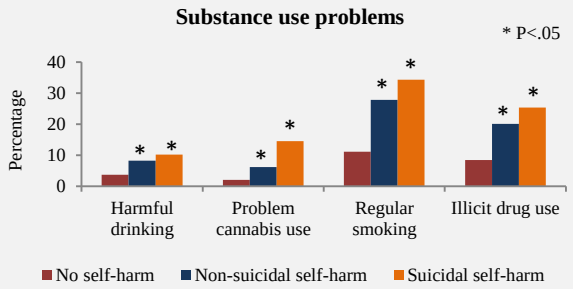
Self-harm at age 16 years

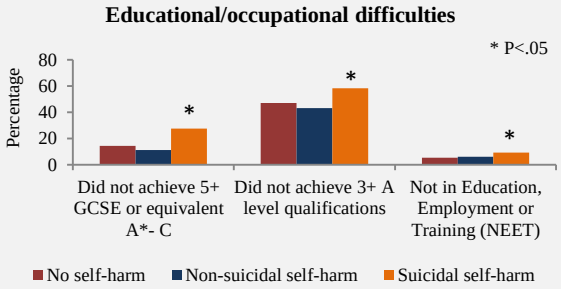
Out of 4799 adolescents



Results







Summary

- Adolescents who self-harm have a greater risk of mental health problems future self-harm and substance use problems in early adulthood, regardless of suicidal intent
- Associations were generally stronger for suicidal than for non-suicidal self-harm
- Suicidal self-harm is also a risk marker for poorer educational and occupational outcomes

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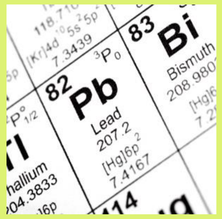
Low level lead exposure and pregnancy outcomes: dose–response relationships



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CHILDREN OF THE 90S

Background

- Lead (Pb) is a neurotoxic metal that is still widespread in the environment.
- Pb readily crosses the placenta and can have adverse effects on birth outcomes, possibly by accumulating in the placenta and causing reduced nutrient transfer, oxidative stress and abnormal function.
- Zhu et al. (2010)[1] suggested that the decrease in birthweight per 1 µg/dl increase in blood Pb is greater at lower than at higher concentrations, without evidence of a lower threshold of effect.
- This is of importance given the high prevalence of low level Pb exposure among pregnant women in developed countries and the controversy regarding the recommended action level for maternal blood Pb.[2]

Aim

- Our aim was to investigate whether there was evidence for a differential effect and/or a threshold value for effects on birthweight and other birth outcomes in a large cohort of pregnant women in the UK.

Methods

- Pregnant women resident in the Avon area of the UK were enrolled in the Avon Longitudinal Study of Parents and Children (ALSPAC).
- Whole blood samples were collected and analysed by inductively coupled plasma dynamic reaction cell mass spectrometry (n=4208 singleton pregnancies).
- Data collected on the infants included anthropometric variables and gestational age at delivery.
- We fitted multivariable fractional polynomials for continuous birth outcomes (birthweight, head circumference, crown–heel length).
- The models were adjusted for confounders including maternal education, smoking, gestational age, and maternal height and pre-pregnancy weight.
- One or two terms of fractional polynomials were explored in terms of x^p for blood Pb, where the power p was chosen from –2, –1, –0.5, 1, 2, 3 and natural logarithmic transformation.
- Lowess (locally weighted scatterplot smoother) curves were fitted for the three outcomes: this method fits a smooth curve between two variables.
- Sensitivity analysis was conducted by excluding the upper and lower 5% of blood Pb values.
- Statistical analysis was done using the mfp command in Stata v. 13.

Results

- The median blood Pb value was 3.40 (interquartile range 2.66–4.34, range 0.20–19.14) µg/dl.
- For all continuous birth outcomes, adjusted models that assumed a linear relationship between untransformed blood Pb and the outcomes provided the best fit.
- For every increase in Pb of 1 µg/dl, the model predicted decreases in birthweight of 9.77 g, head circumference 0.03 cm and crown–heel length 0.05 cm.
- Sensitivity analysis confirmed that models were robust (linear relationships confirmed). This was confirmed by the lowess curves.

Table 1. Associations between maternal blood Pb and birth outcomes modelled with adjusted multivariable fractional polynomial models

	n	Unstandardised B regression coefficient	95% CI	Fit in adjusted mfp model (final powers)
Birth weight (g)	**3096**	–9.77	–20.22, 0.68	1
Head circumference (cm)	**2741**	–0.03	–0.06, 0.00	1
Crown–heel length (cm)	**2706**	–0.05	–0.10, 0.00	1

Models were adjusted for maternal educational attainment, smoking, gestational age, maternal height and pre-pregnancy weigh, infant sex. 1, linear

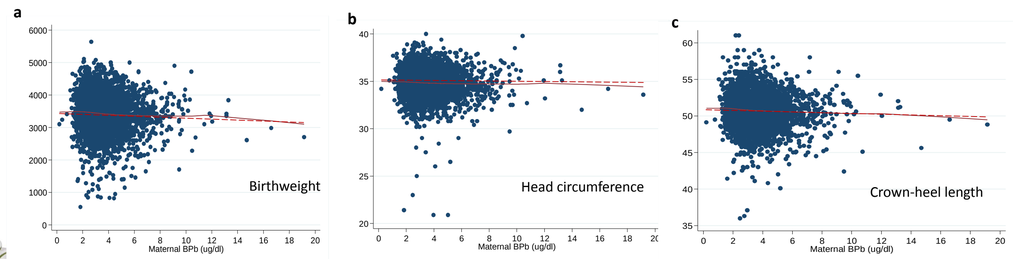

Figure 1. Model-based dose–response relationships between maternal BPb levels and birth weight (a), head circumference (b) and crown–heel length (c) fitted using multivariable fractional polynomials (mfp) and lowess smoothing curves. The mfp models were adjusted for maternal educational attainment, smoking, gestational age (centred at 40 weeks), maternal height and pre-pregnancy weight, and sex of the infant. (a) Birth weight; (b) head circumference; (c) crown–heel length.

Conclusion

- Estimated changes in birthweight, head circumference and crown–heel length with a 1 µg/dl change in blood Pb did not vary across the Pb distribution.
- Thus there was no evidence in this study to suggest that there is a lower threshold for the effect of maternal blood Pb on birth outcomes, or for a supralinear dose–response relationship.
- These results suggest that exposure to Pb should be kept as low as possible during pregnancy to minimise adverse outcomes
- Investigations in other cohorts are needed.

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1. Zhu et al. (2010) Env Health Perspect 188:1471–5
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Do home moves affect child development?

Comparing pre-school children in the US and the UK

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Introduction

Families with young children have relatively high residential mobility. In child development research moves are often presumed an 'adverse life event' because they are inherently disruptive and they are often contemporaneous to parents' break-ups. In the residential mobility literature, moves are seen as positive changes leading to better housing and neighbourhoods. We explore the association of moves with child outcomes at age 5 and compare the UK to the US, where residential mobility is generally higher.

Research questions

1. **How much residential mobility is there among children under age 5?**
2. **Which families move?**
3. **Do children show better or worse outcomes at age 5 if they move?**
4. **Do child outcomes vary if they move to a better/worse area?**

Data and methods

- Millennium Cohort Study (MCS) 2001-2006, and Fragile Family Study and Child Wellbeing Study (FFS) 1999-2004
- Enhanced comparability: including only MCS children born in large city hospitals; constructing a comparable index of local areas' disadvantage based on census data.
- Outcome: deficit in verbal skill at 5 (z-scores)
- All results are weighted for the surveys' designs

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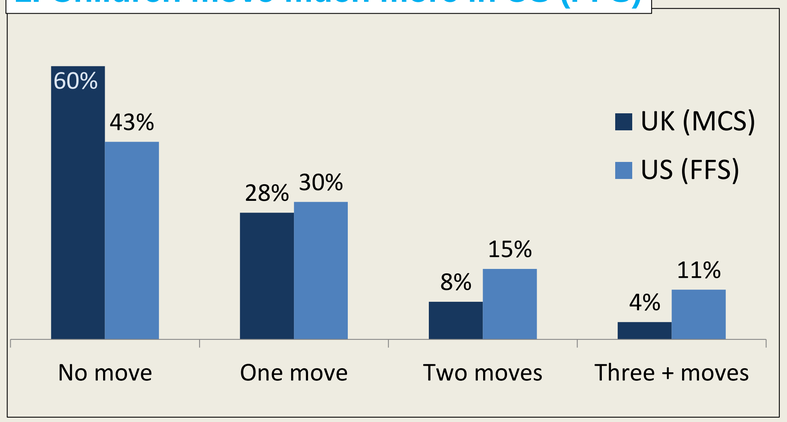
Answers

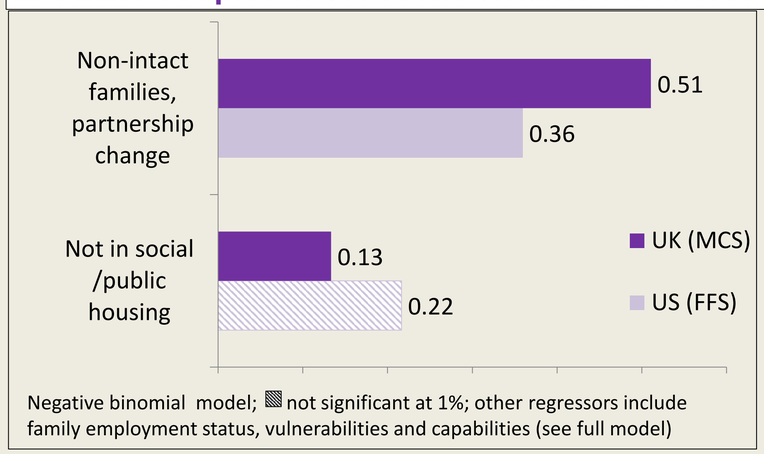
1. Children move much more in US (FFS)



Relative to the US (FFS), among UK (MCS) children we find that:

- Parents are less likely to break-up and/or re-partner
- Parents are less likely to change employment status though more likely to be workless or in employment throughout
- Social housing is much more common

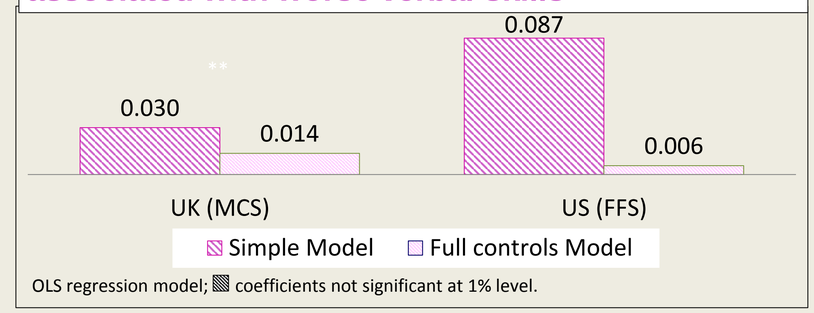
2. Stable couples & UK social tenants move less



Negative binomial model; ▨ not significant at 1%; other regressors include family employment status, vulnerabilities and capabilities (see full model)

In both countries, home owners make the fewest moves. But in the UK, social tenants make fewer moves than private tenants, while in the US there is no difference.

3. NO: Number of moves is not significantly associated with worse verbal skills

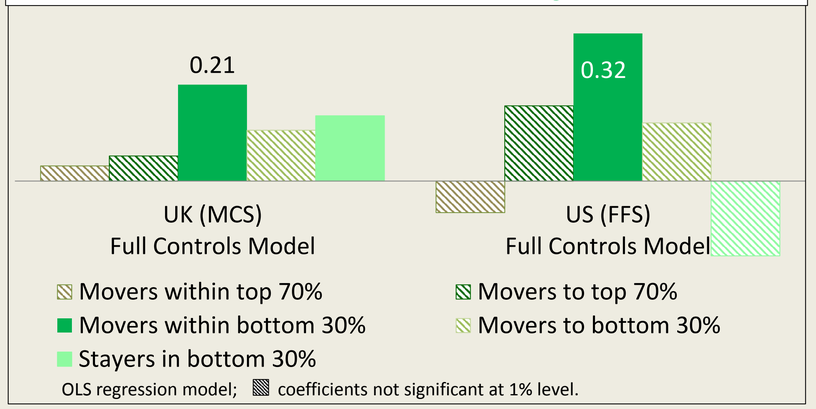


OLS regression model; ▨ coefficients not significant at 1% level.

Full controls include:

- Family structure/change
- Employment status/change
- Household at baseline: tenure, income and size
- Birth of additional child
- Cohort member: whether first born, whether low birth weight, health, sex, age
- Respondent (mother): age, education, ethnicity

4.YES: Moves within 30% most disadvantaged areas show lower verbal skills in 5 year olds



OLS regression model; ▨ coefficients not significant at 1% level.

The nature and circumstances of moves matter – children who move within 30% bottom areas have worse verbal skills outcomes.

Acknowledgements:' Home Moves in the Early Years' is supported by ESRC (grant ES/K000438/1) and Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD).(grant R15 HD065653)

Early educational attainment among children with a cleft in England

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CLEFT REGISTRY & AUDIT NETWORK

1. Background

In the UK, around one in every 700 live born children have a cleft affecting their lip, palate or both. A cleft can affect hearing, speech, dental health and psychosocial health. However, little is known about the impact of facial clefting on non-health outcomes, such as educational achievement.

2. The Early Years Foundation Stage Profile (EYFSP)

The EYFSP is a National Curriculum teacher assessment of children's development at five years. Six areas of learning are assessed (Table 1).

Table 1. EYFSP areas of learning
Personal, social & emotional development (PSE)
Communication, language and literacy (CLL)
Mathematical development (MAT)
Knowledge & understanding of the world (KUW)
Physical development (PD)
Creative development (CD)

3. Data

The Cleft Registry and Audit Network (CRANE) is a national database that was established in 2000 and collects information on all children born with a cleft in England, Wales and Northern Ireland. The National Pupil Database (NPD) contains records on educational outcomes for all pupils in England from 1995/96 onwards.

4. Objectives

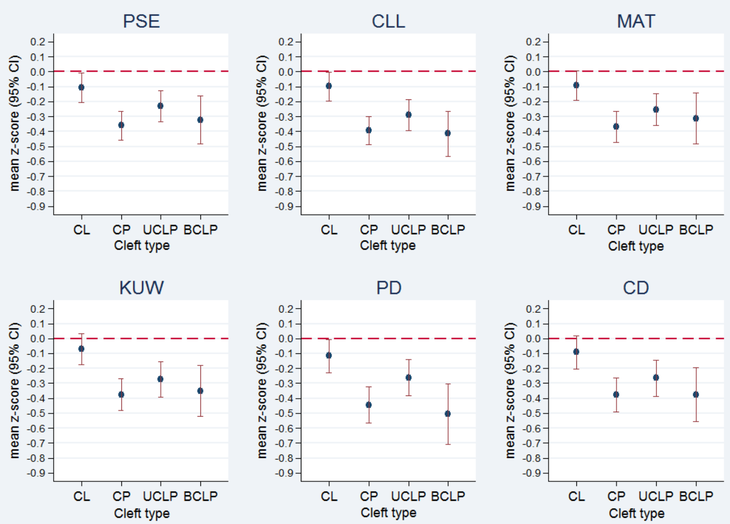
1) To link the CRANE database and the NPD.
2) To explore early educational attainment among non-syndromic children with a cleft in England.

5. Methods

Records of CRANE-consented children born between 2000 and 2008 were linked to the NPD at the individual level. Hospital Episode Statistics records were used to identify and exclude children with additional anomalies or syndromes.

Using year and sex-specific general population means and standard deviations, standardised scores (z-scores) were calculated for each CRANE-registered non-syndromic child for each area of learning.

Figure 1. Mean z-scores and 95% confidence intervals for each area of learning at five years of age among non-syndromic children with a cleft compared to the general population. CL, cleft lip; CP, cleft palate; UCLP, unilateral cleft lip and palate; BCLP, bilateral cleft lip and palate.



6. Results

- 86% of eligible CRANE records were linked successfully to NPD records.
- 2,802 non-syndromic children with a cleft were included in the analyses of EYFSP data.
- Non-syndromic children with a cleft have z-scores that are significantly below the national average within each of the six areas of learning (Fig 1).
- The greatest differences appear to be within the physical development (PD) area, closely followed by the communication, language and literacy (CLL) area (Fig 1).
- Children with a cleft lip (CL) alone fare better than those with a cleft affecting the palate (Fig 1).

7. Conclusions

A high CRANE-NPD linkage rate was achieved.
Compared to the general population, children with a cleft without additional anomalies or syndromes have lower academic scores across all assessed areas at five years of age. Children with a cleft may benefit from extra academic support when starting school.

8. Future directions

Tracking children's educational progression will allow us to study whether attainment gaps persist and to what extent, or whether children with a cleft catch up with their peers in the general population.

Acknowledgements: This work was funded by the national Specialist CommSissioning Group for England and the Wales Specialised Health Services Committee and was carried out by the CRANE team, which is overseen by the UK NHS Cleft Development Group.

Evidencing inequalities in the early years and beyond: 10 years of the Growing Up in Scotland study

Line Knudsen

Growing Up in Scotland

ScotCen
Social Research that works for society

The Growing Up in Scotland Study

The Growing Up in Scotland study (GUS) is a longitudinal research project tracking the lives of several cohorts of Scottish children from the early years, through childhood and beyond. The study is funded by the Scottish Government and carried out by ScotCen Social Research. Focusing initially on a cohort of c.5,000 children aged 10 months (birth cohort 1 - BC1) and a cohort of c.3,000 children aged just under 3 years (child cohort), the first wave of fieldwork began in April 2005. A third cohort of c.6,000 10-month-old children was recruited in 2011 (birth cohort 2 - BC2).

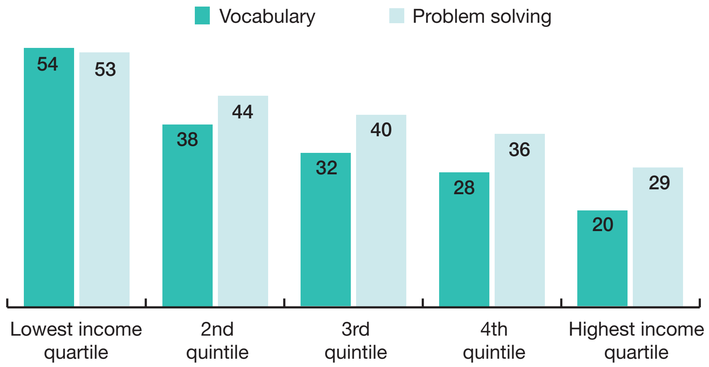
This poster illustrates how, over the last 10 years, GUS has contributed to our understanding of the prevalence and impact of socio-economic inequality amongst children living in Scotland.

1. Demonstrating inequalities in child development

GUS has highlighted the importance of addressing inequalities in Scotland, and the need to do so from an early age. Analyses of GUS data have demonstrated the social patterning of children's developmental outcomes, with children living in more advantaged circumstances consistently reporting better outcomes than their less advantaged peers. This pattern is evident across a range of outcomes – including behavioural and socio-emotional development, a range of health outcomes, and cognitive development.

Figure 1: % of children with a lower than average ability score at age 5, by equivalised household income

Base: All BC1 children who completed cognitive exercises at age 5 interview



2. Comparing inequalities in outcomes over time

The multi-cohort design enables comparison of the social patterning of child outcomes over time. Using this we can explore whether there has been a narrowing (or, indeed, widening) of the 'gap' in outcomes between children growing up in more and less advantaged circumstances.

Recent analysis of age 3 data from the two birth cohorts found no change in the social patterning of vocabulary, but suggested that the 'gap' in problem solving ability between children in the highest and the lowest income households had narrowed slightly between 2007/08 and 2013.

Figure 2: Vocabulary scores at age 3

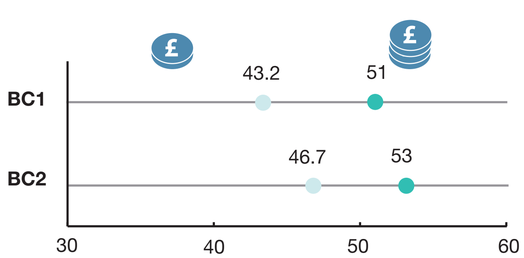


Figure 3: Problem-solving scores at age 3

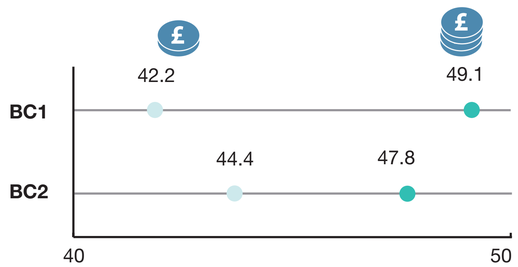
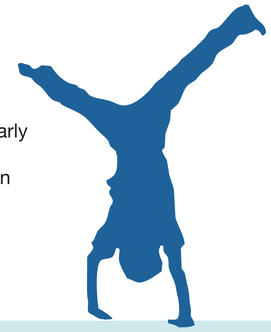


Figure 1:
Scottish Government (2015) Tackling inequalities in the early years: Key messages from 10 years of the Growing Up in Scotland study. Edinburgh: Scottish Government

Figures 2 & 3:
Bradshaw, P., Knudsen, L., and Mabelis, J. (2015) Growing Up in Scotland: The circumstances and experiences of 3-year-old children living in Scotland in 2007/08 and 2013. Edinburgh: Scottish Government

3. Identifying factors associated with better outcomes

Longitudinal analyses of GUS data have identified a number of additional factors present in early life which are associated with improved outcomes in later childhood – something which has been of key importance for policy makers and others looking to improve outcomes for children in Scotland.



A rich home learning environment…

… is associated with higher cognitive ability scores at age 3 and with improved cognitive ability between ages 3 and 5

High quality early learning and childcare*…

… is associated with improvements in vocabulary between ages 3 and 5

Positive maternal mental health…

… is associated with better social, emotional and behavioural development in children at age 4

4. Identifying factors that mitigate risks

Longitudinal analyses of GUS data have also allowed the identification of factors with potential to mitigate some of the risks of poor outcomes associated with growing up in disadvantaged circumstances.

- Having a mother with no long-term health problems…
- Living in a household with at least one parent in employment…
- Being exposed to a rich home-learning environment…
- Being born to a mother aged over 35…

… are all independently associated with children living in disadvantaged circumstances avoiding negative health outcomes

Moving forward

With its specifically Scottish focus, GUS is well-placed to continue informing Scottish policy and practice and has done so through widespread dissemination of findings. Importantly, as a longitudinal birth cohort study GUS also shares characteristics with a number of other UK and international cohort studies, including ALSPAC, the Millennium Cohort Study and Growing Up in Ireland. Furthermore, as the children in GUS enter adolescence, the extent of overlap with studies such as LSYPE1 and 2 and Understanding Society will increase, enabling further cross-study comparisons.

Bromley, C. (2009) Growing Up in Scotland: The impact of children's early activities on cognitive development. Edinburgh: Scottish Government
Bradshaw, P. (2011) Growing Up in Scotland: Changes in child cognitive ability in the pre-school years. Edinburgh: Scottish Government
Bradshaw, P., Lewis, G. and Hughes, T (2014) Growing Up in Scotland: Characteristics of pre-school provision and their association with child outcomes. Edinburgh: Scottish Government
Marryat, L. and Martin, C. (2010) Growing Up In Scotland: Maternal mental health and its impact on child behaviour and development. Edinburgh: Scottish Government
Bromley, C. and Cunningham-Burley, S. (2010) Growing Up in Scotland: Health inequalities in the early years. Edinburgh: Scottish Government

* Defined as attending pre-school providers with a high 'care and support' grade as assessed by the Care Inspectorate.

Identifying predictors of recorded child maltreatment using data from a birth cohort study

Helen Baldwin (Research Fellow), Department of Social Policy & Social Work, University of York

Research aim

To identify predictors of recorded child maltreatment.

Design and methods

This study used a catch-up design, linking together two types of pre-existing data collected at different time points:

1. Data from questionnaires administered to expectant mothers during antenatal appointments, as part of the Born in Bradford (BiB) cohort study.
2. Administrative data held by Bradford Council on children who have subsequently been identified as 'in need' of social work services due to abuse or neglect.

Measures of maternal age, socio-economic status and mental health were compared between mothers whose children were recorded as 'in need' due to abuse or neglect, and mothers whose children were not recorded as 'in need' due to abuse or neglect. The Index of Multiple Deprivation 2010 (IMD 2010) was used as an indicator of socio-economic status, and the General Health Questionnaire—28 (GHQ-28) measured maternal mental health.

Children with recorded abuse or neglect (n=1,126) Vs. Children with no recorded abuse or neglect (n=10,206)

This study is the first to collect pre-birth data on children who subsequently come into contact with the child protection system for reasons of abuse or neglect.

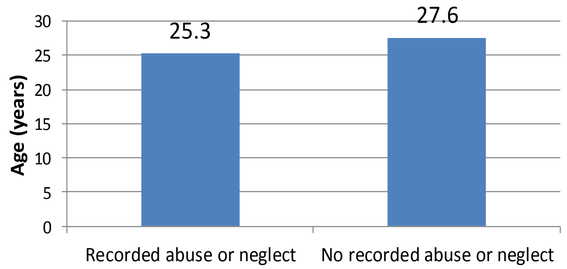
Findings

Initial findings suggest that compared to mothers of children with no recorded abuse or neglect, mothers of children with recorded abuse or neglect:

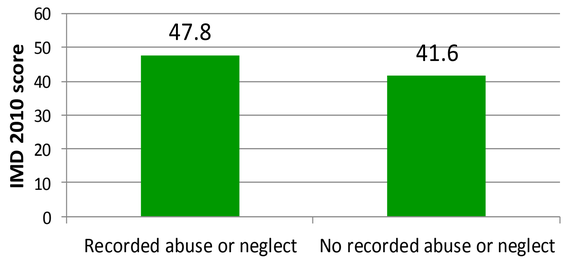
- were younger
- were from more deprived backgrounds, and
- had higher levels of minor psychiatric disorder

during pregnancy.

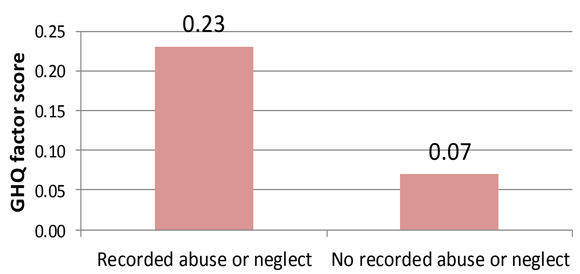
Maternal age



Deprivation



Mental health



Differences were significant at the 99% confidence level.

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Research team: Prof Nina Biehal, Jim Wade, Dr Linda Cusworth, Helen Baldwin, Prof Kate Pickett, Dr Victoria Allgar & Prof Panos Vostanis

Intergenerational Mobility and Adult Oral Health in a British Cohort

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Comparison of the fit of alternative lifecourse models for the association between social class and mouth/gum trouble (n=10,217)

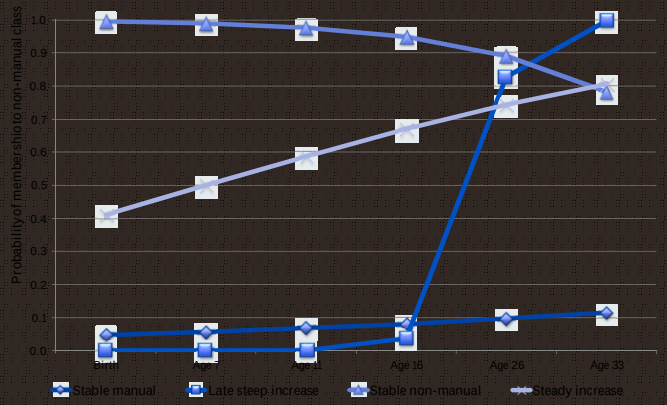
Lifecourse model	Statistical equation tested[a]	Partial Likelihood Ratio (LR) test against saturated model[b]		
		LR	df[c]	p value
Persistent mouth/gum trouble				
Critical period	$\alpha+\beta_1S_1+\beta_2S_2+\beta_3S_3$	10.99	4	**0.027**
Accumulation	$\alpha+\beta_1(S_1+S_2+S_3)$	16.92	4	**0.002**
Social trajectories	$\alpha+\beta_1S_1+\beta_2S_2+\beta_3S_3+\theta_{12}S_1S_2+\theta_{23}S_2S_3$	3.22	2	**0.200**
Mouth/gum trouble in the last 12 months				
Critical period	$\alpha+\beta_1S_1+\beta_2S_2+\beta_3S_3$	12.22	4	**0.016**
Accumulation	$\alpha+\beta_1(S_1+S_2+S_3)$	16.85	4	**0.002**
Social trajectories	$\alpha+\beta_1S_1+\beta_2S_2+\beta_3S_3+\theta_{12}S_1S_2+\theta_{23}S_2S_3$	**2.41**	**2**	**0.300**

[a] S_1, S_2 and S_3 refer to the three time points (6, 16 and 33 years, respectively). β_i and θ_i refer to the regression coefficient for main and interactive effects

[b] The saturated model was $\alpha+\beta_1S_1+\beta_2S_2+\beta_3S_3+\theta_{12}S_1S_2+\theta_{23}S_2S_3+\theta_{13}S_1S_3+\theta_{123}S_1S_2S_3$

[c] df: degrees of freedom for the comparison against the saturated model

Probability of membership to non-manual social class in four social class trajectories from birth until age 33 years (n=17,169):
stable manual: 44.7% (n=7,672); late steep increase: 18.6% (n=3,203); steady increase: 21.2% (n=3,640); and stable non-manual:



Association between social class trajectories and persistent trouble with gums or mouth at age 33 years (n=11,285)

Classes	N	%	(95% CI)	OR[a]	[95% CI]	p value
Outcome: Ever had persistent trouble with gums or mouth						
Stable manual	3,943	6.4	(5.6-7.2)	1.00	[Reference]	
Late steep increase	2,956	5.0	(4.3-5.8)	0.72	[0.58-0.89]	0.002
Steady increase	1,927	5.0	(4.0-6.0)	0.73	[0.57-0.93]	0.010
Stable non-manual	2,459	4.3	(3.5-5.1)	0.63	[0.50-0.80]	<0.001
Outcome: Persistent trouble with gums or mouth in last 12 months						
Stable manual	3,943	5.4	(4.7-6.1)	1.00	[Reference]	
Late steep increase	2,956	4.3	(3.5-5.0)	0.72	[0.57-0.91]	0.005
Steady increase	1,927	4.0	(3.1-4.9)	0.69	[0.53-0.90]	0.007
Stable non-manual	2,459	3.5	(2.8-4.2)	0.61	[0.47-0.79]	<0.001

Logistic regression models were fitted controlling for sex. Odds ratios (OR) were therefore reported

Introduction

Social mobility is good for society because it encourages placement of individuals in social positions according to competence rather than social origin (1), and it is highly consistent with the philosophy of many political parties of "opportunity for all" (1, 2). Increasing social mobility is therefore viewed as a desirable social policy to reduce health inequality (2, 3). Social mobility can be inter- or intra-generational; the former refers to movement between generations (e.g. from parents' to individuals' own social position) while the latter refers to changes that take place within the career of an individual (4). There is evidence that most social mobility is likely to occur at younger ages (5).

Three conceptual models have been proposed to clarify the complex and dynamic lifecourse processes that influence adult morbidity and mortality: the critical period model maintains that an exposure at a certain period of development results in adverse effects later in life; the accumulation model considers that exposures gradually accumulate over life to increase the risk of disease; and the social trajectories model refers to chains of risk by which one negative exposure increases the subsequent risk of another negative exposure (4, 6). Knowing which model best reflects the timing and duration of exposure to socioeconomic disadvantage may provide important clues to address social inequalities in health.

Previous studies have shown that social mobility is related to adult oral health (7-12); however, all these studies assessed social position at two points in time (childhood and adulthood). This is the simplest scenario in lifecourse epidemiology, and as such, unlikely to represent the entire array of social circumstances that individuals experience across their lifespan. The analysis of repeated socioeconomic measures can be handled with structural equation modelling techniques that allow the classification of individuals into different groups with homogenous developmental trajectories (where those within a group are very similar to one another but the groups are very different from each other) (12, 13).

Goal

This study aimed to characterise trajectories of intergenerational mobility from birth to age 33 years, and to assess the influence of these trajectories on adult oral health.

Method

Repeated data on occupational social class (birth and 7, 11, 16, 23 and 33 years) and two subjective oral health indicators (lifetime and past-year prevalence of persistent trouble with gums or mouth) measured at age 33 years, from the 1958 National Child Development Study, were used for this analysis. Latent class growth analysis (LCGA) was used to identify different trajectories of exposure to manual social class over time. Binary logistic regression was then used to explore the association between these trajectories and each oral health indicator, adjusting for participants' sex.

Results

All available data from 17,169 individuals were used for this study. LCGA showed that a four trajectory model provided the best fit to the data. The four trajectories that emerged were identified as stable manual (44.7 % of participants), stable non-manual (21.2 %), late steep increase (18.6 %) and steady increase (15.5 %). Individuals in the late steep increase, steady increase and stable non-manual trajectories were 28 % (95 % CI: 11 - 42 %), 27 % (7 - 43 %) and 37 % (20 - 50 %) less likely to report ever having persistent trouble with gums or mouth than those in the stable manual trajectory. Similarly, individuals in the late steep increase, steady increase and stable non-manual trajectories were 28 % (9 - 43 %), 31 % (10 - 47 %) and 39 % (21 - 53 %) less likely to report having persistent trouble with gums or mouth in the last 12 months than those in the stable manual trajectory. No differences were found between other trajectories (p > 0.05 for all paired comparisons).

Conclusions

The social trajectories model was the most appropriate, in terms of model fit, to describe the association between social class and oral health. Although four distinctive trajectories were identified in the 1958 NCDS, only those who remained in the manual social class over time reported worse oral health by age 33 years.

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Predicting Future Individual Weight Status From Measurements Made In Early Childhood: A Novel Longitudinal Approach Derived From Millennium Cohort Study Data

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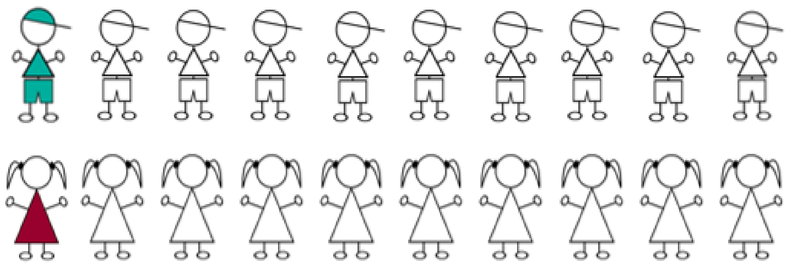
Teesside University

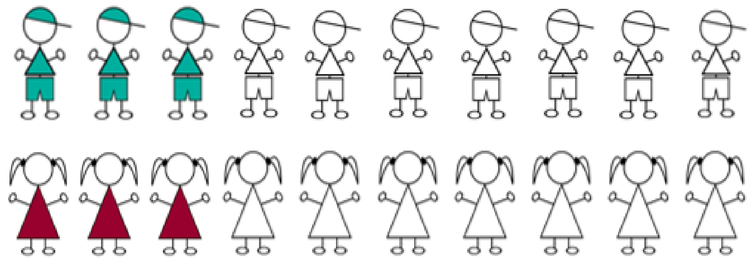
Teesside University is sponsoring this project for the purposes of research governance

Objective: The aim of this analysis was to develop a novel and robust analytic approach to predict the individual weight status of 11-year-old children from data collected at age 5, and to explore the influences of sex and deprivation. This may potentially offer good translation in practice.

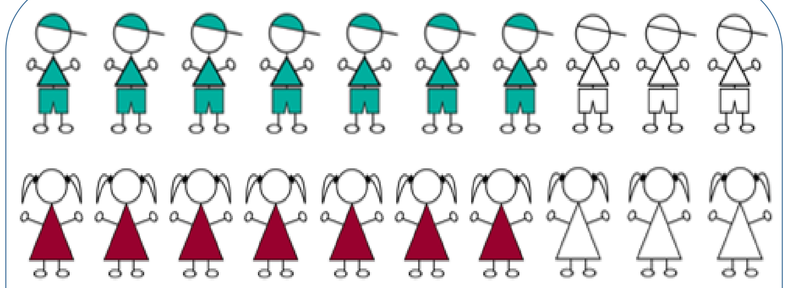
Data/methodology: Raw BMI values from the Millennium Cohort Study (MCS) were converted into BMI z scores and used to create clinical weight status categories using the UK1990 growth reference. All analyses were performed in Stata. Ordinal logistic regression was employed to derive the predicted probability (% chance) of a child becoming underweight, normal weight, overweight, obese and severely obese at age 11, based on their weight status category at age 5, sex and index of multiple deprivation (IMD; fifths).



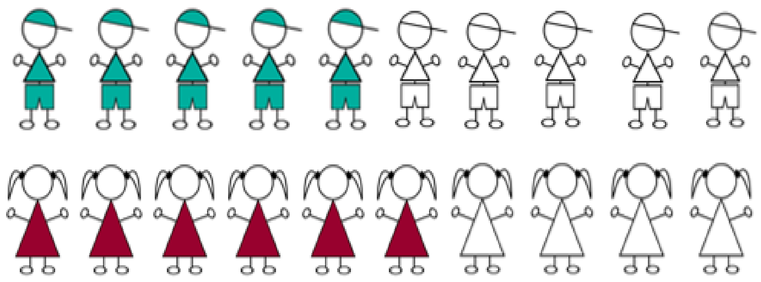
Children who are normal weight at age 5 – 6% boys and 5% girls will be obese (including severe) at age 11



Children who are overweight at age 5 – 30% boys and 34% girls will be obese (including severe) at age 11



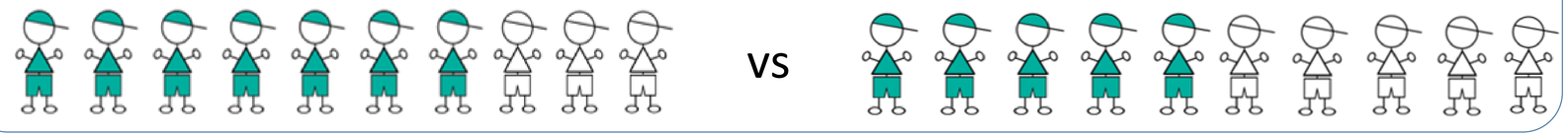
Children who are obese at age 5 – 68% boys and 69% girls will remain obese (including severe) at age 11



Children who are severely obese at age 5 – 50% boys and 57% girls will remain severely obese at age 11

Obese deprived boys vs obese non-deprived boys – chances of remaining obese at age 11

71% vs 50%



Obese deprived girls vs obese non-deprived girls – chances of remaining obese at age 11

63% vs 70%

Conclusion: We have demonstrated the usefulness of ordinal logistic regression for predicting the percentage chances of an individual child changing to or from an unhealthy weight status later in life. This approach is easily interpretable and potentially more informative than a tracking correlation coefficient or an odds ratio.

Study of Early Education & Development

NatCen Social Research that works for society

frontier economics

4Children

Funded by the Department for Education

Study of Early Education and Development (SEED)

ABOUT THE STUDY

A FIVE PART STUDY

1: A longitudinal study of children

2: A study of early years settings (day nurseries, pre-schools, nursery classes, and childminders)

3: Case studies of good practice in early years settings

4: A value for money study

5: Qualitative studies of:
i) childminder experience
ii) experience and outcomes for children with SEN/D

LONGITUDINAL STUDY

A survey of 5,000+ households with a two-year old child

- At home interviews with primary carer when child aged 2, 3 and 4
- Questions about family, child's health and development, use of childcare and early education (plus BAS assessments when child 3 and Heads-Toes-Knees-Shoulders assessment when child aged 4)
- Rolling programme of interviews with six termly cohorts of children born between September 2010 and August 2012
- Interviewing started October 2013 (age 2)
- Final interviews (aged 4) all completed by August 2016
- Data will be linked with information from National Pupil Database to track children's progress (e.g. EYFS and KS1)

STUDY LOOKING AT QUALITY IN EARLY YEARS SETTINGS

1,000 observations in early years settings

- Led by 4Children and Professor Ted Melhuish
- Settings will be those used by children in the study at age 2 and age 3
- All types of setting will be covered
- Rolling programme of setting visits (April 2014 to March 2016)
- Setting assessment based on ECERS-E, ECERS-R, ITERS and SSTEW
- Sampling is iterative, based on information from interviews with families on take-up and use of settings
- Setting level data linked back to children in the longitudinal study - will look at relationship between setting quality and later attainment

REPORTS

All reports available at: http://www.seed.natcen.ac.uk/reports.aspx

Published reports:

- Speight S, Maisey R, Chanfreau J, Haywood S, Lord C, Hussey D (2015) Study of Early Education and Development: Baseline Survey of Families, DfE Research Report DFE-RR480.
- Otero M P, Melhuish E (2015) Study of Early Education and Development (SEED): Study of the Quality of Childminder Provision in England, DfE Research Report DFE-RR480B
- Callanan M (2014) Study of Early Education and Development: Views and Experiences of Childminders, DfE Research Report DFE-RR395.

More reports will be published between now and 2020.

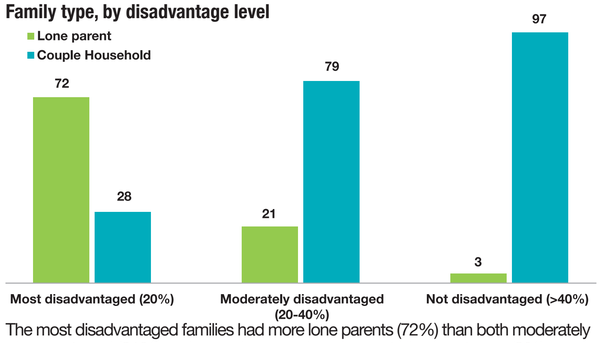
KEY FINDINGS FROM THE LONGITUDINAL STUDY

DISADVANTAGED GROUPS

GROUP 1	GROUP 2	GROUP 3
most disadvantaged (20%)	moderately disadvantaged (20-40%)	not disadvantaged (>40%)

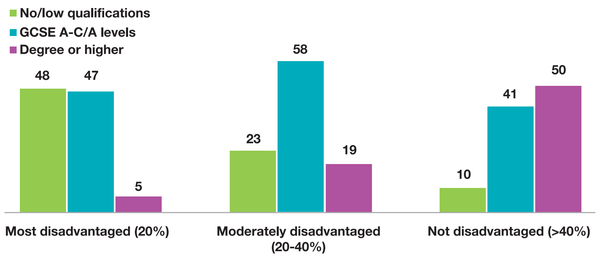
PROFILE OF THE STUDY SAMPLE

Family type, by disadvantage level



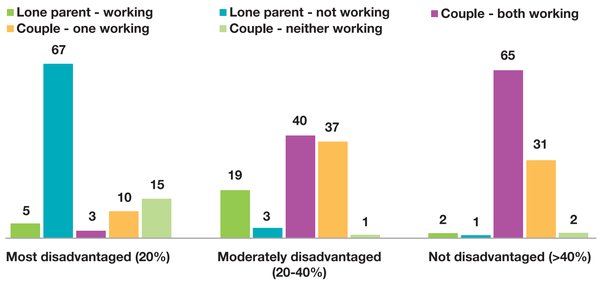
The most disadvantaged families had more lone parents (72%) than both moderately disadvantaged (21%) and households which were not disadvantaged (3%).

Mothers' highest academic qualification, by disadvantage level



The highest level of academic qualification achieved by the child's mother differed significantly by level of disadvantage. Many more mothers achieved degree level or higher qualifications within households which were not disadvantaged (50%) than in the most disadvantaged families (5%).

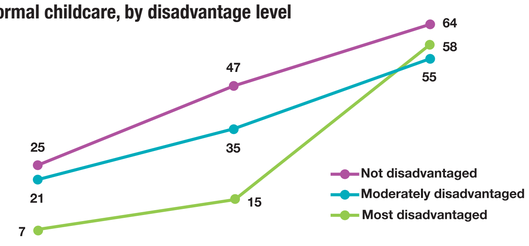
Household economic status by disadvantage level



Household economic status also differed considerably by level of disadvantage. Households which were not disadvantaged were mainly couples where at least one parent was in work (95%). The most disadvantaged households in the sample were mainly households in which neither parent was in work (82%).

CHILDCARE USE FROM BIRTH TO AGE TWO

Use of formal childcare, by disadvantage level



Base: All children Source: SEED Baseline

Children from the 20% most disadvantaged families were the least likely to receive formal childcare before age two. Only 7% of these children received formal childcare before the age of 12 months and only 15% between one and two years old, compared with 20% and 36% respectively for all children in the study. However, after turning two, over half of children in all three groups were receiving formal childcare (58% of children in the most disadvantaged families, and 60% of all children).

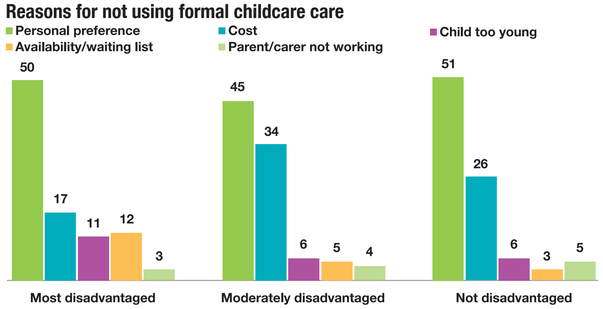
Take-up of funded early years provision for two-year-olds

Take-up of two-year-old entitlement, by disadvantage level

	Most disadvantaged (20%)	Moderately disadvantaged (20-40%)	Not disadvantaged (>40%)	All
Received funded childcare	48	11	3	16
Received formal childcare but no funded hours	10	44	59	43
Did not receive formal childcare	42	46	38	41
Unweighted bases	*1,649*	*1,975*	*2,018*	*5,642*
Weighted bases	*1,263*	*1,918*	*2,461*	*5,642*

Almost half of children (48%) from the most disadvantaged families were receiving the Government funded two-year-old entitlement. About a tenth of children (10%) in these families were receiving formal childcare but not the funded hours, and about two fifths (42%) were not receiving any formal childcare at age two. The largest proportion of those who were receiving the funded hours of early education reported using a day nursery.

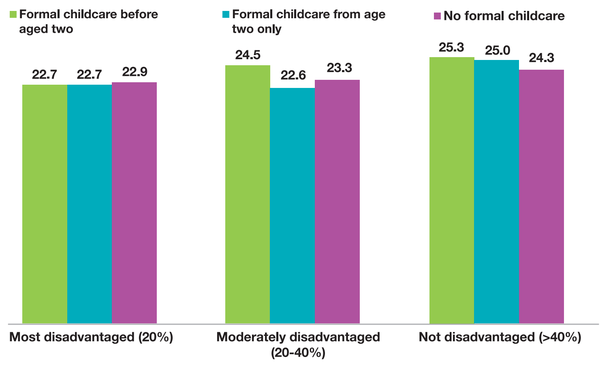
Reasons for not using formal childcare care



Base: Families not using formal childcare Source: SEED Baseline

A substantial proportion of two-year-olds (42% of the most disadvantaged and 46% of moderately disadvantaged children) either received no childcare at all in term time or received childcare from providers who were not eligible to offer funded hours (e.g. informal childcare providers).
The most common reason for not using formal childcare as reported by parents was personal preference. However, a substantial minority of families mentioned cost of childcare as their main reason. This was mentioned by 17% of those in the most disadvantaged families, 34% of those in moderately disadvantaged families, and 26% of those in the not disadvantaged families. Furthermore, limited availability and being on a waiting list were mentioned by 12% of those in the most disadvantaged families, 5% of those in moderately disadvantaged families and 3% of those in the not disadvantaged families.

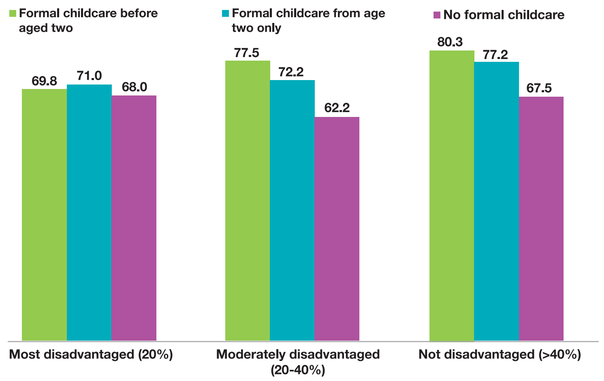
Home learning environment



Families' economic circumstances were strongly associated with their home environment. Parents in disadvantaged families were significantly less likely to engage in home learning activities than those whose economic circumstances were better.
Within the groups of families who were not disadvantaged or were moderately disadvantaged, there were further differences by use of childcare. Families where children were receiving formal childcare before age two were more likely to engage in home learning than those families where children had never received any formal childcare. However, there were no statistically significant differences by childcare use within the group of the most disadvantaged families.

LANGUAGE SKILLS

Sure Start Language Measure (SSLM) score, by formal childcare use and disadvantage group



Children from the most disadvantaged families had substantially less developed language skills (SSLM score of 69.8) compared with children from moderately disadvantaged families (77.5) and children from families that were not disadvantaged (80.3).
Children's receipt of formal childcare before age two was associated with better developed language skills compared with no formal childcare, but only in families which were not disadvantaged or were only moderately disadvantaged.

RESEARCH TEAM

- Dr Jane O'Brien, NatCen Social Research
- Dr Svetlana Speight, NatCen Social Research
- Professor Edward Melhuish, University of Oxford
- Sue Robb, 4Children
- Dr Gillian Paull, Frontier Economics

The Effect of Inactivity on Childhood Obesity
Is Waist Circumference at age 7 related to Sedentary Activities at Age 5 in MCS Children?

Simorra Puigdollers, R., Ash, R.

Faculty of Life Science and Computing

London Metropolitan University, Holloway Road N7 8DB, London, UK

Background

Childhood obesity has risen dramatically and it has several co-morbidities associated that track into adulthood. Many factors seem to influence the development of childhood obesity. Physical inactivity has been shown to contribute to childhood obesity but results from different studies diverge. On the other hand, assessing childhood obesity is not straightforward; BMI has been widely used but studies show that waist circumference might be more accurate since it detects central body fat which contributes to the obesity co-morbidities (metabolic syndrome). Although many studies agree with reducing television viewing as part of the obesity prevention and treatment, there is limited evidence for young children.

Objective

To examine the relationship between inactivity (TV watching and computer use) and anthropometric measurements in the cohort members who participated in the Millennium Cohort Study (MCS) between 2006 and 2008.

Methods

The study involved a secondary analysis of the MCS data that took place in the UK (2001-2008). Data from surveys 1, 2, 3 and 4 was downloaded from the internet. Around 15,000 children participated in the cohort study. Children at 9 months had their birth weight and socioeconomic factors recorded. At ages 3, 5 and 7 years anthropometric measurements were taken (weight, height, waist circumference, BMI, percentage body fat).

Statistical Analysis

Inactivity was calculated adding the hours spent watching TV and using computer. Children were divided into five categories according to the level of inactivity: very low inactivity (<5 hours), low inactivity (5-10 hours), medium inactivity (10-15 hours), high inactivity (15-20 hours) and very high inactivity (> 20 hours).

Results

Waist circumference increased two times more in the severely inactive group (6.1 cm) compared to the least inactive group (3.4 cm). Children who did more physical activity (with parents and alone) had significantly ($p<0.05$) lower weight, BMI and waist circumference (see *table 1* below). However, those relationships were not constant at all ages. On the other hand, children who watched more TV and used computer for more hours had significantly ($p<0.01$) higher weight, waist circumference, BMI and percentage body fat. Furthermore, those that had TV in their rooms had significantly higher weight and waist circumference ($p<0.001$). Weight and waist circumference was significantly related to TV watching and independently associated to socioeconomic status.

Table 1. Relationship between hours of TV viewing at ages 5 and 7 and anthropometric measurements at ages 5 and 7.

	TV viewing			
	Age 5		**Age 7**	
	Correlation coefficient (r)	Significant (p)	Correlation coefficient (r)	Significant (p)
Age 5				
Weight (Kg)	0.033**	0.000	0.022*	0.014
Waist circumference (cm)	0.033**	0.000	0.022*	0.013
Age 7				
Weight (Kg)	0.034**	0.000	0.037**	0.000
Body fat (%)	0.054**	0.000	0.058**	0.000
Waist circumference(cm)	0.034**	0.000	0.047**	0.000
BMI (Kg/m2)	0.044**	0.000	0.043**	0.000

* Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

Conclusions

Results from this report support the use of waist circumference as an effective tool to detect central body fat in children. Moreover, they illustrate the detrimental effects of a great amount of inactivity in very young children. Reducing television viewing and computer use in young children should be considered in both the prevention and treatment of childhood obesity. Interventions should involve a multidisciplinary team and long-term evaluation.

References are available upon request.

The feasibility of collecting objective physical activity data from 14 year olds on the Millennium Cohort Study

Anne Conolly[1], Emily Gilbert[2] & Lisa Calderwood[2]

[1]Ipsos MORI, [2] Centre for Longitudinal Studies, UCL Institute of Education

Background

Measuring physical activity presents methodological challenges for survey research. Most large-scale population based studies use self-reported data to measure physical activity which is subject to both recall and social desirability bias. The intensity of physical activity is also subjective in self-reported data.

The use of devices that measure physical activity directly can offer a solution to these problems. Accelerometers are capable of capturing a wide range of movements as well as the differing intensity of activities. Increasingly, accelerometers are also being recognised for their ability to measure sedentary activities as well as sleep behaviour.

Methods

The Millennium Cohort Study (MCS) follows over 19,000 children born in the UK in 2000/1. The sixth sweep of the survey collects data from cohort members when they are 14 years old.

The feasibility of collecting accelerometer data was assessed through a number of qualitative and quantitative methods before the start of the Age 14 Survey.

- Qualitative research was carried out with 14-year olds and their parents to explore the acceptability of activity monitor data collection, among other survey elements.
- Two pilot studies were carried out in February 2014 (n=52) and July 2014 (n=97).

Field interviewers placed wrist-worn accelerometers with respondents during face-to-face visits and asked them to wear the device for two complete days; one during the week and one at the weekend. After completing the second day respondents were asked to return the accelerometer in a pre-paid envelope.

Two different types of accelerometer were used during the pilot studies. Respondents were not given a choice of device and were not aware that there was an alternative.

Results

Respondents' reactions to accelerometry tended to be positive, both in the qualitative research and during the pilots. Most young people were intrigued by the idea of wearing the activity monitors and liked the idea of having their activity recorded.

The qualitative work also revealed some misconceptions about the devices (e.g. that they could track location), concerns around completing the task (e.g. being made to take the device off for organised sport) and some practical issues (e.g. remembering to wear it).

> I'd want to know if it has a tracker in it… you never know, there could be… or a hidden camera! I'd feel uncomfortable…

James, who identified the three most important things in his life as football, football and football, was sure he wouldn't be able to wear the accelerometer in football matches.

Direct feedback from respondents revealed that the GENEActiv device was more comfortable and discreet than the ActiGraph.

The following table shows compliance data from the second pilot study:

	GENEActiv		ActiGraph		All	
						
	n	%	n	%	n	%
Eligible respondents	47	100	50	100	97	100
Agreed to accelerometry	42	89	44	88	86	88
Device returned*	32	68	23	46	55	57
Valid data obtained	23	49	16	32	39	40

*within 4 weeks of the end of pilot fieldwork

- 88% agreed to wear the device
- 57% returned the device
- 40% provided valid data (worn >10 hours per day)

There were no significant differences between the two devices when it came to agreeing to complete the task (89% GENEActiv vs 88% ActiGraph). A higher proportion of devices were returned from those allocated the GENEActiv device (68%, compared to 46% ActiGraph) and valid data was obtained from a higher proportion of those allocated the GENEActiv device (49%, compared to 32% ActiGraph).

Conclusions

Accelerometry data collection was implemented on the MCS Age 14 Survey using GENEActiv devices.

Findings from the development work helped inform the survey protocols and materials. For example, providing respondents with explanatory letters to give to sports clubs / sending respondents SMS reminders to wear the accelerometer.

The pilots demonstrated that accelerometry response, return and compliance rates were comparable to other population-based accelerometry studies.

UCL Institute of Education

Ipsos MORI

NEPS
National Educational Panel Study

LIfBi
LEIBNIZ INSTITUTE FOR EDUCATIONAL TRAJECTORIES

The German Birth Cohort Study

Introduction

The NEPS collects longitudinal data on educational processes in Germany from early childhood to late adulthood. Education starts not with entry in school but from birth onwards (Weinert, Doil & Frevert, 2008). Therefore, one of the 6 starting cohorts of NEPS is the birth cohort, which focus on the development of children from seven months onwards, the learning environments in their families as well as on aspects of the out-of home child care. To measure educational aspects over several waves, indirect (parent interview) and direct measures were combined.

Sample

The birth cohort study focuses on a representative sample of 3,500 children born between February and June 2012. The sample was drawn over a two-stage random method, resulting in 90 sample points in Germany. The majority of the families agreed in participating in the parent interview as well as the direct measures. Over 99% of the families gave their panel consent.

Measures

Whenever possible, the paradigms used for both direct and indirect measures were based on international questionnaires and tests.

Direct measures

In the first waves direct measures such as sensorimotor tasks, a habituation paradigm (assessing learning resources) and a parent-child interaction are used. Starting at wave four, tablet-based tests were used.

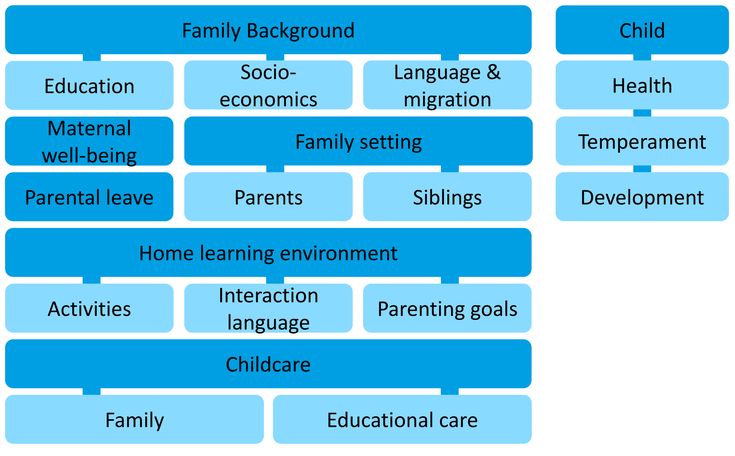
Sensorimotor tasks.

Habituation paradigm.

Parent-child interaction.

Tablet-based tests.

Parent interview



Surveys

The first wave took place when the children were between 6 and 8 months old. The families were visited in the child's home. Up to now, the data collections of the first four waves are finished:

	Wave 1	Wave 2	Wave 3	Wave 4
	Main 1	Main 2	Main 3	Main 4
Year	2012	2013	2014	2015
Age	0;6-0,8	1;0-1;5	2;1-2;3	3;1-3;3
Sample	N = 3,481	$N_{interview}$ = 2,849 $N_{subgroup*}$ = 1,510	N = 2,609	N = 2,481
SUF release	Early 2015	Late 2015	2016	2017

Summary

The longitudinally observation of the children and their families allowed detailed analyses of the development of competencies, the prerequisites of competencies, educational processes and trajectories. Further, the design of the NEPS allowed to build a link to a further longitudinal study (multi-cohort sequence design) that started in 2010 when children were 5;0 years of age. The NEPS provides all data to the scientific community.

References
Weinert, S., Doil, H. & Frevert, S. (2008). Kompetenzmessung im Vorschulalter: Eine Analyse vorliegender Verfahren. In H. G. Roßbach & S. Weinert (Eds.), *Kindliche Kompetenzen im Elementarbereich: Förderbarkeit, Bedeutung und Messung*(89-209). Berlin: BMBF.

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Why are children in urban neighbourhoods at increased risk for childhood psychotic symptoms?

Findings from a UK longitudinal cohort study

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MRC Social, Genetic & Developmental Psychiatry Centre

MRC Medical Research Council

King's College London Institute of Psychiatry, Psychology & Neuroscience

E·S·R·C Economic & Social Research Council

BACKGROUND

- **Urban** upbringing **doubles** a child's odds of adulthood **schizophrenia**.[1]
- Recently, **childhood** psychotic symptoms (which predict schizophrenia in adulthood[2]) have been shown to be **more common** among urban children.[3]

DOES NEIGHBOURHOOD-LEVEL ADVERSITY EXPLAIN WHY URBAN CHILDREN HAVE A HEIGHTENED RISK FOR PSYCHOTIC SYMPTOMS?

METHODS

- Environmental-Risk (E-Risk) Longitudinal Twin Study. Nationally representative twins born 1994-1995. (N=2232)

- Follow-ups: ages 5, 7, 10 and 12 (96% retention)
- Neighbourhood characteristics measured at two time-points by multiple informants

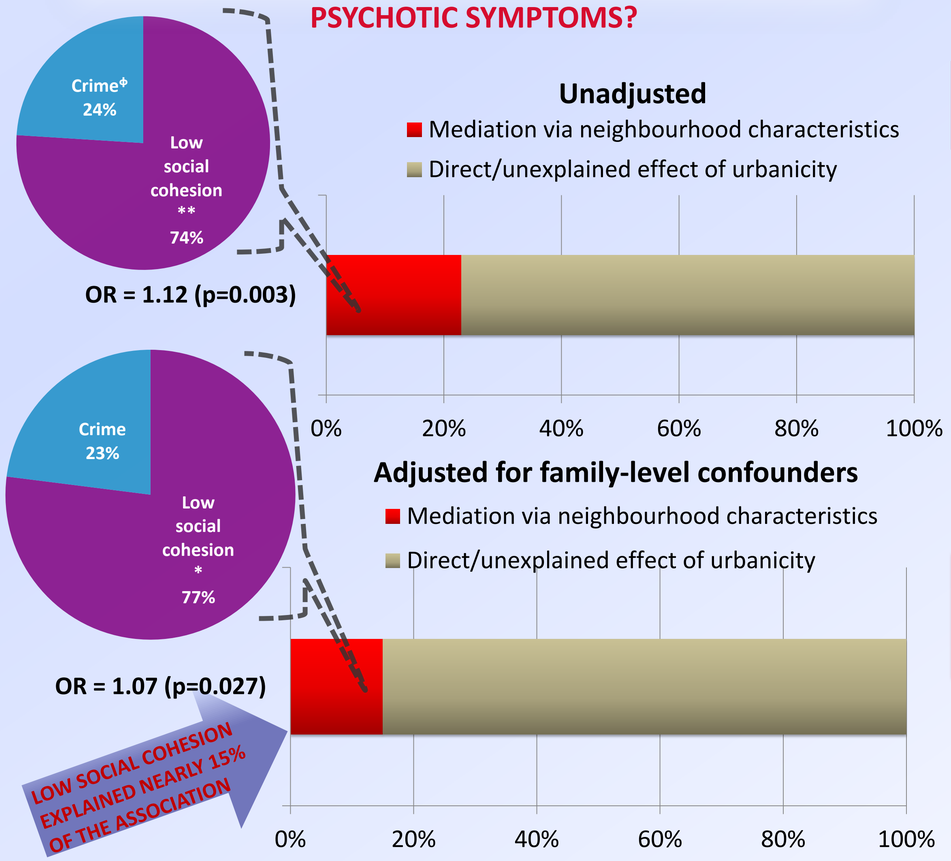
MEASURES

VARIABLE	DESCRIPTION	METHOD
PSYCHOTIC SYMPTOMS (Outcome)	Positive psychotic symptoms. 6% (N=125) children at age 12	Private child interviews (age 12)
URBANICITY (Predictor)	Cities and towns versus suburbs, villages and the countryside. 50:50 split at age 12.	Neighbourhood surveys (age 12)
NEIGHBOURHOOD CHARACTERISTICS: (Mediators)	Based on sociological concept of social processes[4,5]	Mother reports (age 5) Neighbourhood surveys (age 12)
Social cohesion[4]	Neighbour trust, cooperation, amicability etc.	
Social control[4]	Neighbours intervening in problems in the neighbourhood	
Neighbourhood disorder[5]	Neighbourhood threats such as rubbish, abandoned buildings theft, gang activity etc.	
Crime victimisation	Direct victimisation by a crime in the neighbourhood (e.g. mugging)	

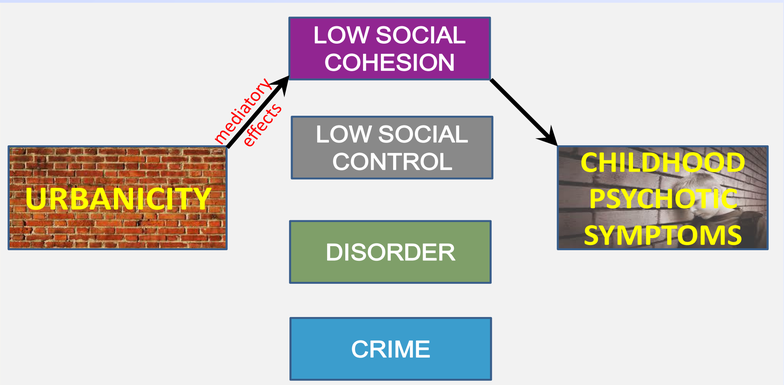
RESULTS

- **<u>Urbanicity was associated with childhood psychotic symptoms</u>**
  OR=1.76, 95% CI=1.15-2.69, p=0.009
  Not explained by family SES, family psychiatric history or maternal psychosis
- **Urban neighbourhoods** had **lower levels** of social cohesion and control, and **higher levels** of neighbourhood disorder and crime. **(all p's<0.05)**
- **Children** in these neighbourhoods were **more likely** to experience **psychotic symptoms** at age 12 **(all p's<0.05)**

DO NEIGHBOURHOOD-LEVEL CHARACTERISTICS MEDIATE THE ASSOCIATION BETWEEN URBANICITY AND CHILDHOOD PSYCHOTIC SYMPTOMS?



SUGGESTED MEDIATORY PATHWAY BETWEEN URBANICITY AND CHILDHOOD PSYCHOTIC SYMPTOMS



CONCLUSION

- **Children** in towns and cities were around **80% more likely** to experience **psychotic symptoms** (p=0.009)
- **Low neighbourhood social cohesion** explained nearly **15%** of this effect of **urbanicity** on childhood psychotic symptoms
- <u>Low neighbourhood social cohesion partly explains why urban children have a higher risk for developing psychotic symptoms</u>
- **<u>POTENTIAL OPPORTUNITY FOR MORE TARGETED INTERVENTIONS FOR EARLY EXPRESSIONS OF PSYCHOSIS?</u>**

ACKNOWLEDGEMENTS

The authors thank all E-Risk families, research workers and office team for their continued participation and dedication. This study was supported by the Economic and Social Research Council and the UK Medical Research Council

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