CLOSER Conference

Childhood adversity

Chair: **Margaret O'Brien**

- Longitudinal, cross-national comparisons of the long-term trajectories of care leavers
  Claire Cameron
- Associations between child maltreatment and adult physical functioning in a prospective British birth cohort
  Snehal Pinto Pereira
- Psychosocial adversity and socioeconomic position during childhood and epigenetic age: analysis of two prospective cohort studies
  Rebecca Lawn

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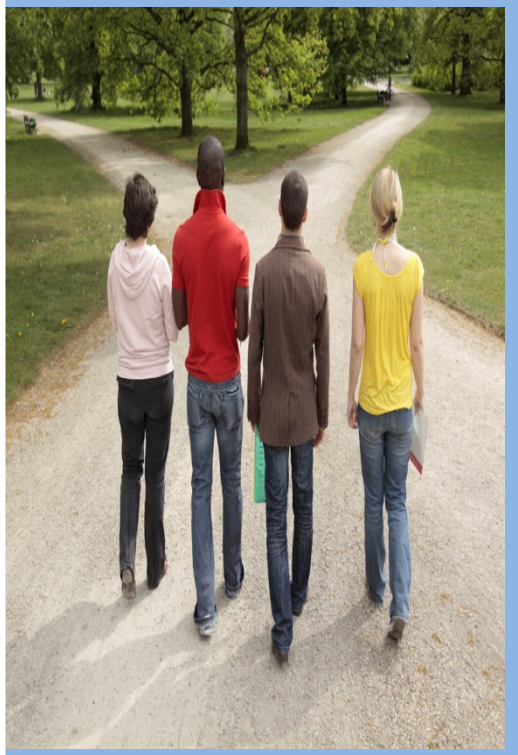
Care leavers aged 30: How do they fare in Britain, Finland and Germany

Key findings from population based studies



Claire Cameron
Thomas Coram Research Unit

http://www.ucl.ac.uk/ioe/departments-centres/centres/thomas-coram-research-unit

Who are care leavers?

- Young people (aged 18+) who have been looked after in foster care or residential care as children
- Chances of being looked after under age of 18: 2.5% (Germany), 3.1% (Finland) and 3.8% (Britain)
- Transitions to adulthood are ‘compressed and accelerated’ – they leave care before others leave home; multiple responsibilities; impoverished resources, health and wellbeing – a ‘cliff edge’

Aim – taking a longer view

- What are care leavers' trajectories around aged 30?
- Education, employment, family life, health and well-being
- Comparisons
  - Different types of welfare state – or 'transition regime'
  - 'In care' vs 'never in care'

Data sources

- British Cohort Study (BCS70, born 1970)
  - ❖Never in care: 17,000; ever in care: 350
- Finnish Birth Cohort (FBC) study (born 1987) linked administrative records
  - ❖Never in care: 59,476; ever in care: 1900
- German SOEP Panel study (born 1961-1995)
  - ❖Never in care: 6,541; ever in care: 148

Education

CASMIN	Britain – BCS70		Finland – 1987 FBC		Germany – SOEP 2001-2015	
%	Ever in care Age 30	Never in care Age 30	Ever in care Age 28	Never in care Age 28	Ever in care Mean age 31	Never in care Mean age 29
CASMIN 1a & 1b (primary)	21.1	8.6	42.8	10.4	28.0	11.9
CASMIN 1c, 2a, 2b and 2c (secondary)	29.1	35.7	51.6	51.7	62.9	70.1
CASMIN 3a (lower tertiary)	21.7	20.1	5.3	25.1	4.2	4.6
CASMIN 3b (upper tertiary)	19.2	34.9	0.3	25.1	4.9	13.4
N	351	10,872	1,895	57,581	143	5,789

- For most care leavers in Finland and Germany, the highest educational level is secondary; less pronounced in England, where more care leavers are in tertiary education
- Clear educational inequality compared to never in care

Main activity aged 30

Activity	Britain – BCS70		Finland – 1987 FBC		Germany – SOEP 2001-2015	
%	Ever in care Age 30	Never in care Age 30	Ever in care Age 28	Never in care Age 28	Ever in care Mean age 31	Never in care Mean age 28
Full-time and part-time employment[1]	65.8	82.1	42.6	73.3	50.3	56.9
Education/apprenticeship/training	2.3	1.5	NA	NA	2.8	9.7
Voluntary social year/gap year	NA	NA	NA	NA	2.1	4.3
Unemployed[2]	7.1	3.1	26.3	11.2	44.8	28.5
Looking after home/family	16.3	9.9	8.1	9.4	NA	NA
Other	8.6	3.4	NA	NA	0.6	NA
Total N	350	10869	1900	57581	145	6504

- Percentage gap between never in care and ever in care highest in Finland and lowest in Germany
- Care leavers in Britain more likely to be in employment – or looking after home

Family life

Status	Britain – BCS70		Finland – FBC 1987		Germany – SOEP 2001-2015	
	Ever in care Age 30	Never in care Age 30	Ever in care Age 28	Never in care Age 28	Ever in care Mean Age 31	Never in care Mean Age 28
Partner/first marriage or cohabiting	60.4	63.8	22.7	21.5	64.2	56.2
Has own children[1]	52.7	43.4	47.5	22.0	73.6	50.2
Teenage parent[1]	22.5	8.5	19.6	3.7	NA	NA
Total N	346	10869	1,895	57,581	148	6541

- Narrow gap on partnership status - follows national trend
- Care leavers more likely to have children than those who had not been in care, especially in Finland and Germany
- A higher rate of teenage parenthood among care leavers

Health and wellbeing

	Britain – BCS70		Finland – FBC 1987		Germany – SOEP 2001-2015	
	Ever in care Age 30	Never in care Age 30	Ever in care Age 28	Never in care Age 30	Ever in care Mean Age 31	Never in care Mean Age 28
Health satisfaction/ Subjective general health rated good or excellent	74.8	85.3	NA	NA	65.8	85.8
High levels of life satisfaction rated good or excellent	61.5	76	NA	NA	74.1	88.2
Depression	24.2	12.4	31.1	7	NA	NA
Psychiatric diagnosis	NA	NA	66.2	17.8	NA	NA
Psychotropic medicine use before age 25	NA	NA	56.1	19.9	NA	NA
Death before age 28	NA	NA	3.7	1.2	NA	NA
Total N	350	10869	1,895	57,581	135	6002

- Positive self-reports of health satisfaction and life satisfaction in England and Germany (not available in Finland), but gap between groups persist (10 - 14 pp)
- Very high levels of psychiatric diagnosis and psychotropic medication in Finland
- High rates of depression

Conclusions

- Poor state of data - caution on comparison

But

- Care leavers continue to be disadvantaged as adults entering their fourth decade
- Relatively little impact of welfare regime type
- Unexpected results vis a vis welfare regime
  - Quite high employment in Britain
  - High unemployment in Germany
  - Rather high medicalisation and low educational participation in Finland

Child maltreatments and adult physical functioning

Snehal M Pinto Pereira

- Child maltreatments: child abuse & neglect

- Facilitating physical functioning: high on policy agenda

Aims

To establish:

- extent to which child maltreatments were associated with adult physical functioning
- mediating pathways: education, adult smoking, mental health, socioeconomic position (SEP)

National child development study,1958-2008

All born one week in England, Scotland and Wales

N~18,000

N~8,000

Birth	7y	11y	16y	23y	33y	42y	45y	50y
1958	1965	1969	1974	1981	1991	2000	2003	2008

Neglect (parent & teacher report)

Recalled abuse (0-16y)

Smoking, psychological distress, educational attainment, SEP

Poor physical functioning

Childhood SEP, birthweight, birth order, household amenities, crowding & tenure, child physical impairment, parental education, chronic & psychiatric illness

Child maltreatments

Neglect	Questions asked (at 7y and 11y)
Neglect (prospective)	constructed from: - child looks undernourished, scruffy or dirty (T) - hardly ever takes outings with mother (P) - hardly ever takes outings with father (P) - mother has little interest in education (T) - father has little interest in education (T) - mother & father hardly ever read to/with child (P)

Abuse	Questions asked (at 45y)
Sexual	- I was sexually abused by a parent
Physical	- I was physically abused by a parent (punched, kicked, hit, beaten with an object, needed medical treatment)
Psychological	- I was verbally abused by a parent; suffered humiliation, ridicule, bullying, mental cruelty from a parent
Witnessing	- I witnessed physical or sexual abuse of others in my family

Prevalence of child maltreatments (N=8,150)

Exposures

	%
Sexual abuse	1.4
Physical abuse	5.6
Witness abuse	5.7
Neglect	9.6
Psychological abuse	10.4

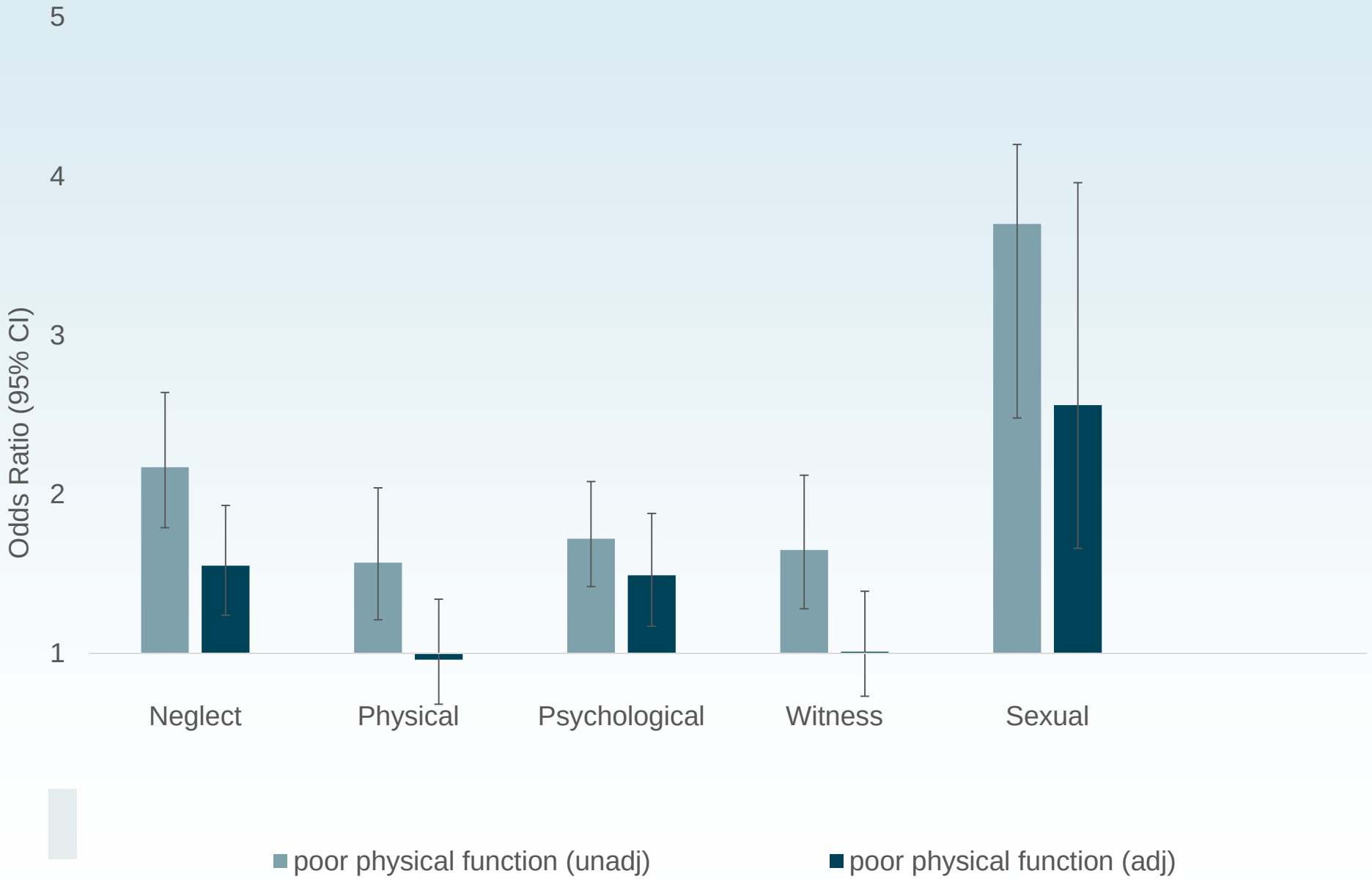
Prevalence of outcome (N=8,150)

Outcome

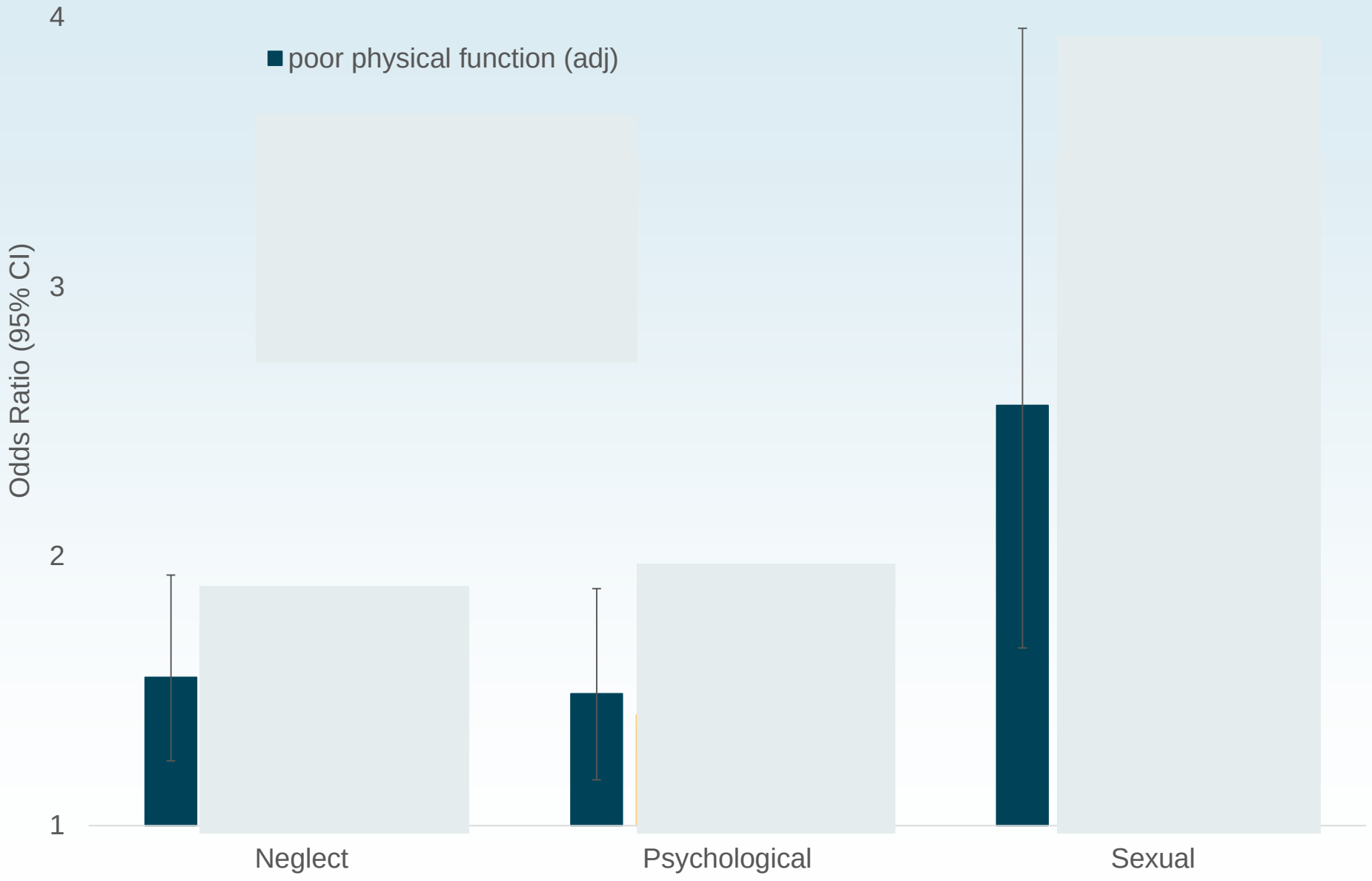
	%
Poor physical functioning*	12.0

* limitations, such as lifting, carrying groceries, climbing stairs, bending, kneeling, stooping and walking moderate distances

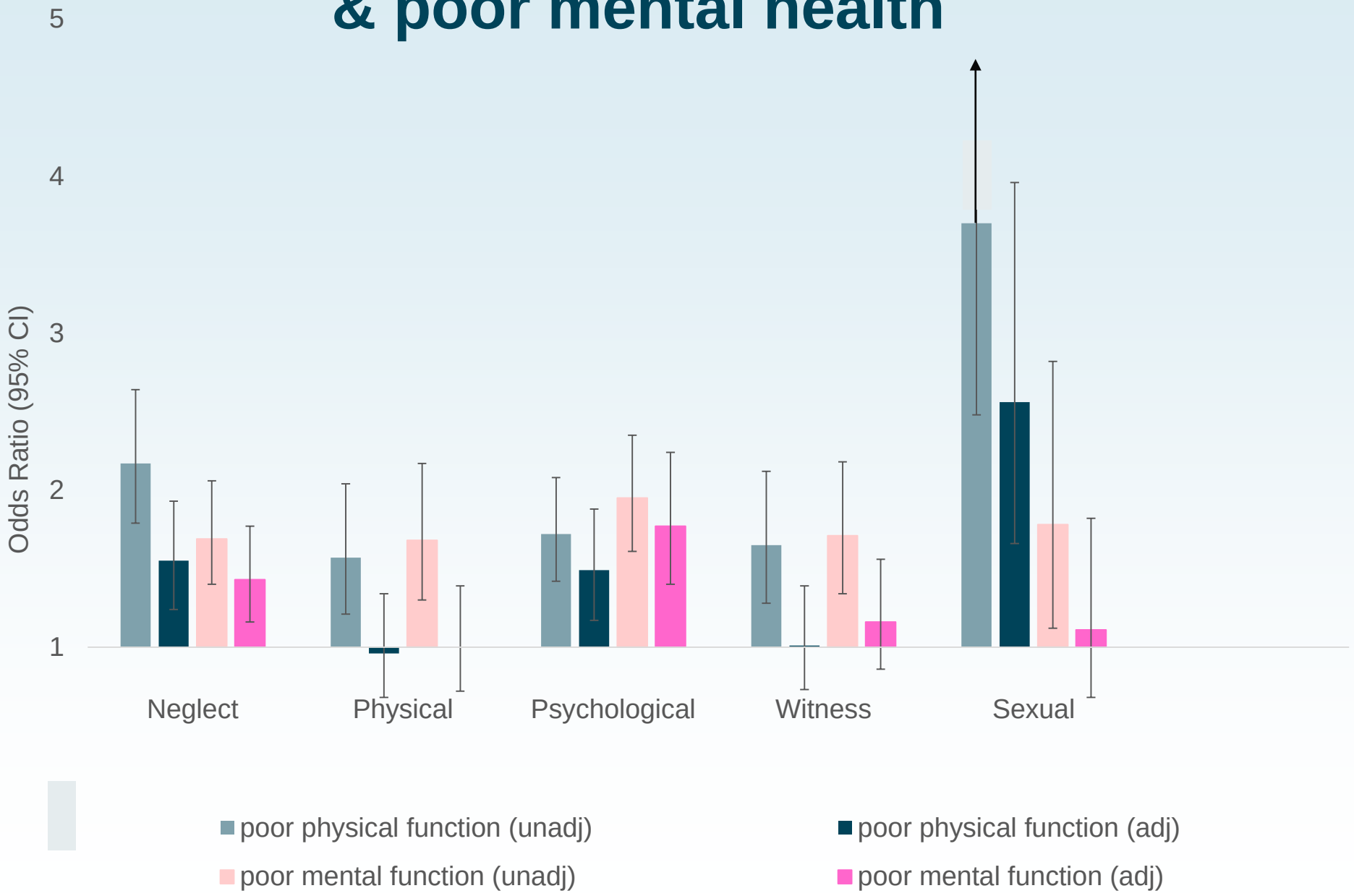
50y poor physical function



50y poor physical function



50y poor physical function & poor mental health



Conclusions

- long-term links
  - child maltreatments — poor physical functioning
- magnitude of associations
  - comparable to those for mental health
- accumulating burden

Implications

- child maltreatments predispose adults to experience problems performing physical tasks of daily living

- Unless findings such as these are recognised & action taken: opportunities will be missed to prevent detrimental long-term outcomes

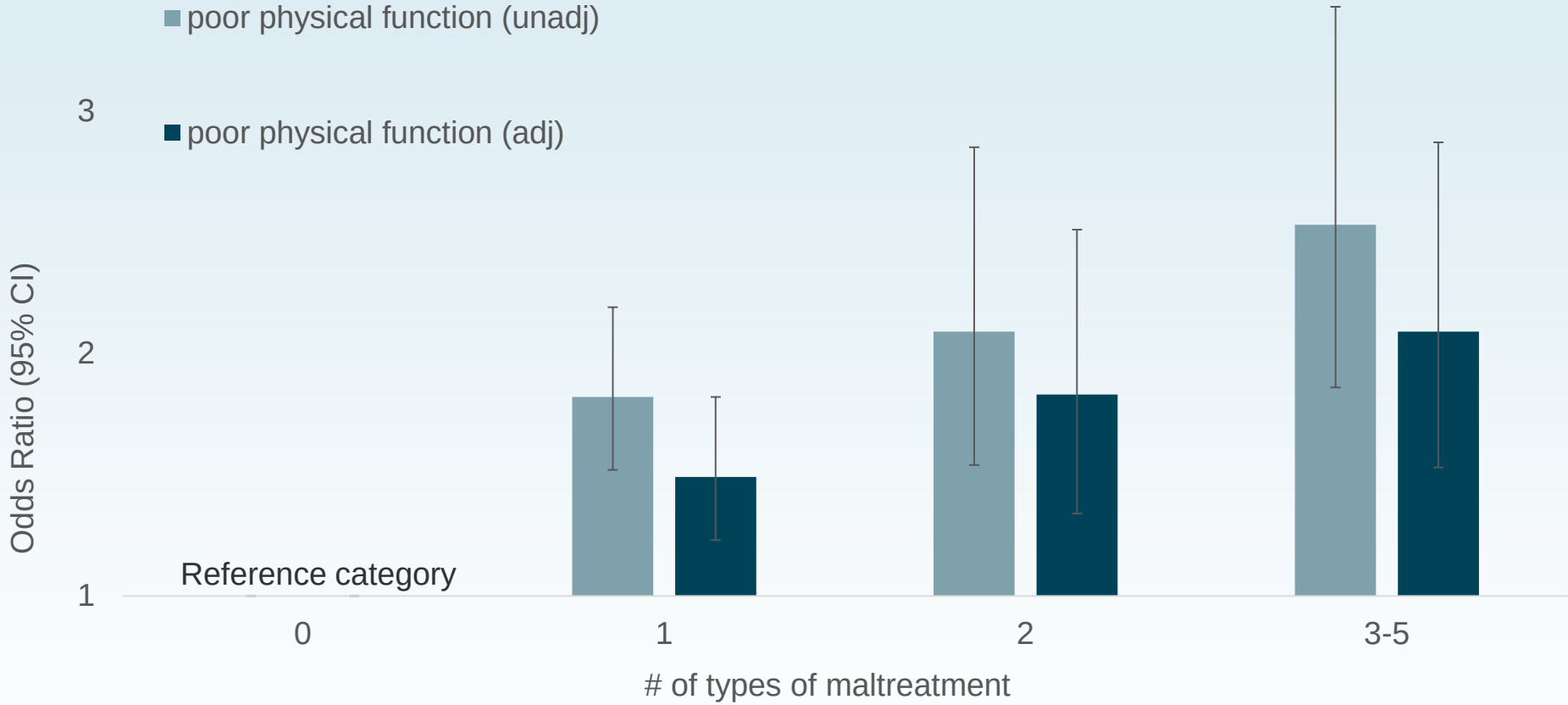
Collaborators:

Gemma Archer

Chris Power

snehal.pereira@ucl.ac.uk

of types of maltreatments & physical functioning



Psychosocial adversity and socioeconomic position during childhood and epigenetic age: analysis of two prospective cohort studies

Rebecca Lawn

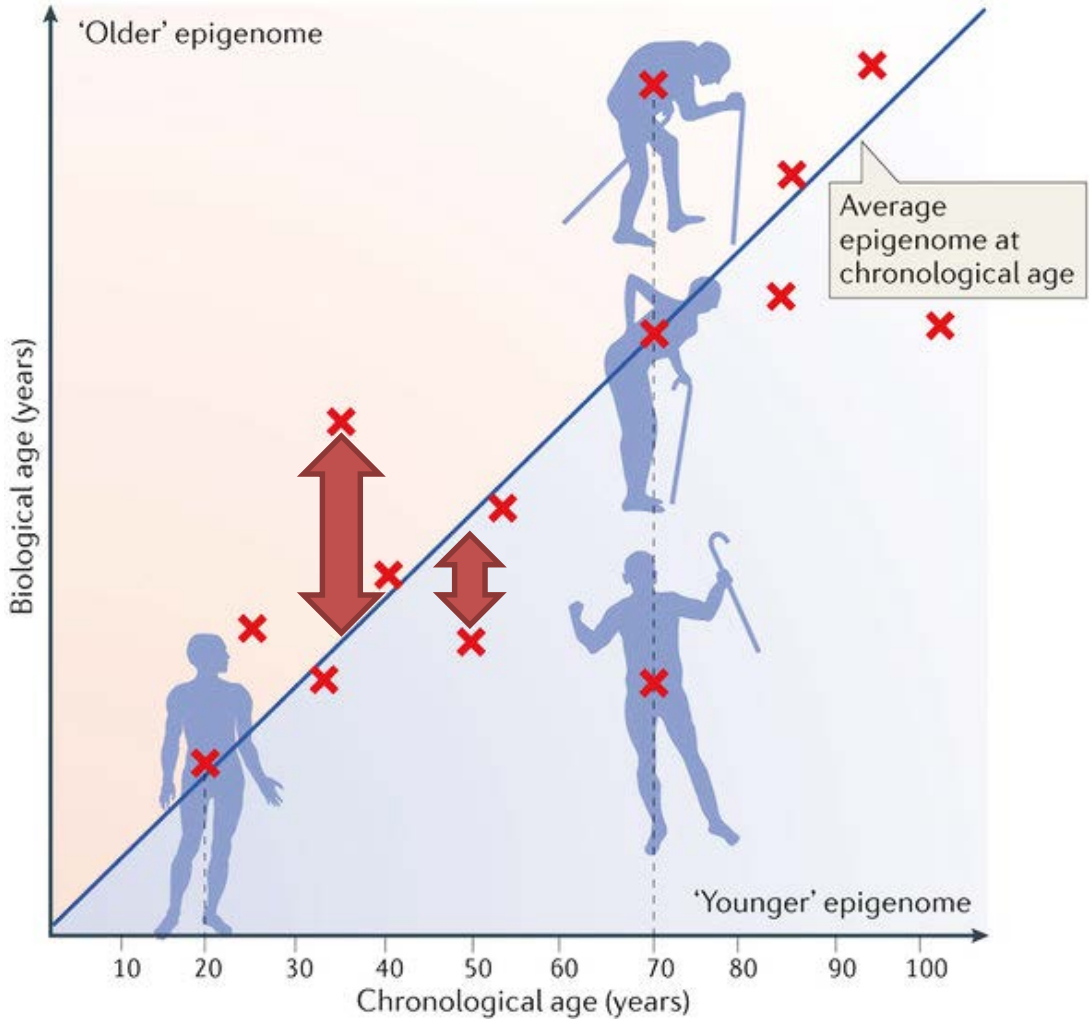
Emma L Anderson, Matthew Suderman, Andrew J Simpkin, Tom R Gaunt, Andrew E Teschendorff, Martin Widschwendter, Rebecca Hardy, Diana Kuh, Caroline L Relton, Laura Howe

Psychosocial adversity, socioeconomic position during childhood and epigenetic age

Associated with accelerated reproductive histories, earlier morbidity onset, premature death…

Reducing harmful effects is crucial for combating equalities but pathways unclear…

(references 1-16)



Horvath., 2013; Benayoun et al., 2015

Exposure to psychosocial adversity and low SEP in childhood

Epigenetic age acceleration from DNA methylation

MRC National Survey of Health and Development

N = 773 (53yrs)

CHILDREN OF THE 90s

N = 989 (29yrs, 47 yrs)

Exposures and covariates

Psychosocial adversity

1. maltreatment (neglect or abuse of any kind)
2. sub-optimal maternal bonding
3. childhood physical illness
4. parental mental illness
5. absence of the mother or father in the household
6. parental physical illness or disability
7. parental divorce or separation
8. death of mother or father in childhood

SCORE
(0, 1, 2, 3+)

Childhood socioeconomic position

Adult socioeconomic position

Outcome

Epigenetic age acceleration

- DNA methylation (peripheral blood in ALSPAC and buccal cells NSHD)
- Epigenetic age using the Horvath method
- Epigenetic age acceleration as residuals
- Adjusted for cell heterogeneity in ALSPAC by estimated cell-type proportions

Statistical Analysis

- Multiple imputation

- Multivariable linear regression models of childhood SEP, each type of psychosocial adversity, and the cumulative score of psychosocial adversity with epigenetic age acceleration

Prevalence of low SEP and psychosocial adversity in childhood

	ALSPAC (n = 989)	NSHD (n = 773)
	% Prevalence	
Manual SEP in childhood	47.7	56.7
Psychosocial adversity before 17 years:		
Parent physically ill	28.7	27.2
Parent absent	16.2	2.3
Child illness	5.3	14.1
Parent mentally ill	32.5	1.8
Sub-optimal maternal bonding	16.5	20.7
Parents separated	13.3	5.8
Parent died	5.1	7.1
Child maltreatment	23	7.2
Cumulative psychosocial adversity score:		
0	33.7	40
1	28.3	39.2
2	17	16.2
3+	21.1	4.5
Items in maltreatment variable in ALSPAC:		
Physical cruelty	3.5	-
Emotional cruelty	8.4	-
Physical neglect	1.5	-
Emotional neglect	20.2	-
Sexual abuse	3.8	-

Associations of childhood SEP and cumulative psychosocial adversity with methylation age acceleration

	ALSPAC age 29y (n = 989)	**ALSPAC age 47y** (n = 989)	**NSHD age 53y** (n = 773)
	Mean difference in methylation age acceleration (years) (95% CI)		
Psychosocial adversity score			
Adjusted for childhood SEP			
0 (ref)			
1	0.04 (-0.85, 0.92)	0.61 (-0.31, 1.53)	0.55 (-0.38, 1.48)
2	-0.84 (-1.90, 0.22)	0.40 (-0.70, 1.50)	-0.61 (-1.82, 0.61)
3	-0.25 (-1.19, 0.69)	0.05(-0.95, 1.05)	-1.39 (-3.51, 0.73)
Childhood socioeconomic position (manual versus non-manual)			
Adjusted for cumulative psychosocial adversity	-0.26 (-0.98, 0.46)	-0.29 (-1.06, 0.48)	0.12 (-0.70, 0.94)

Associations between all forms of psychosocial adversity and methylation age acceleration (unadjusted)

	ALSPAC 29 year data (n = 989)	ALSPAC 47 year data (n = 989)	NSHD at 53 years (n = 773)
	Mean difference in methylation age acceleration (years) (95% CI)		
Parental physical illness	-0.37 (-1.11, 0.38)	0.11 (-0.68, 0.90)	-0.61 (-1.51, 0.29)
Parental absence	0.22 (-0.68, 1.13)	-0.04 (-0.99, 0.90)	0.76 (-1.90, 3.42)
Childhood physical illness	-0.71 (-2.27, 0.84)	0.09 (-1.52, 1.69)	0.07 (-1.09, 1.22)
Parental mental illness	-0.79 (-1.56, -0.03)	-0.03 (-0.79, 0.74)	2.41 (-0.59, 5.42)
Sub-optimal maternal bonding	-0.10 (-1.09, 0.88)	-0.13 (-1.10, 0.84)	-0.04 (-1.08, 1.01)
Parental divorce/separation	0.28 (-0.71, 1.27)	-0.56 (-1.60, 0.47)	-0.97 (-2.68, 0.74)
Parental death	0.72 (-0.87, 2.30)	0.29 (-1.33, 1.91)	-0.26 (-1.82, 1.30)
Child maltreatment	0.05 (-0.76, 0.86)	0.12 (-0.76, 1.01)	-1.26 (-2.93, 0.41)
Adoption	0.17 (-2.00, 2.34)	-0.85 (-3.13, 1.43)	-
Physical cruelty	0.84 (-1.04, 2.72)	0.15 (-1.81, 2.12)	-
Emotional cruelty	-0.28 (-1.52, 0.95)	-0.32 (-1.61, 0.96)	-
Physical neglect	-0.83 (-3.60, 1.95)	-2.06 (-5.40, 1.27)	-
Emotional neglect	0.28 (-0.57, 1.13)	-0.12 (-1.01, 0.77)	-
Spent time in care	-0.35 (-3.44, 2.75)	-1.43 (-4.72, 1.86)	-
Poor family function	0.91 (-0.13, 1.95)	-0.48 (-1.71, 0.74)	-
Sexual abuse	2.74 (0.93, 4.56)	3.34 (1.47, 5.22)	-

	ALSPAC 29 year data	ALSPAC 47 year data
	(n = 989)	(n = 989)
Sexual Abuse	Mean difference in methylation age acceleration (years) (95% CI)	
Adjusted childhood SEP	2.77 (0.96, 4.59)	3.38 (1.50, 5.25)
Additionally adjusted adult SEP	2.78 (0.96, 4.59)	3.41 (1.53, 5.29)

Sexual Abuse

- Previous associations found between sexual abuse and a wide range of adverse outcomes
- Previous study identified differentially methylated probes for physical abuse, sexual abuse and physical neglect
- Other studies often use composite measures and are therefore unable to assess whether methylation changes differ for sexual versus physical or emotional abuse

For other exposures, it is possible that..

- Incorrect that adversity would manifest in higher age acceleration
- Other changes than DNA methylation
- Developmental time periods
- Resilience
- Associations may not persist

Strengths

- Two cohorts with comparable childhood adversity data
- Large number of types of psychosocial adversity
- Horvath method

Limitations

- Power
- Large mean difference NSHD chronological/epigenetic age
- Low Pearson's correlation coefficients between chronological age and epigenetic age
- Retrospective/prospective reporting
- Pregnancy
- Females only

Conclusions

- Sexual abuse was associated with epigenetic age acceleration (approx. 3 yrs.)
- Epigenetic age, as a marker of biological ageing, may mediate associations between sexual abuse and adverse outcomes.
- No evidence of associations of low SEP or other types of psychosocial adversity
- Further large, well characterised studies needed to confirm our findings.

University of BRISTOL

MRC Integrative Epidemiology Unit

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Martin Widschwendter
Rebecca Hardy
Diana Kuh
Caroline L Relton
Laura D Howe

Rebecca.lawn@bristol.ac.uk

@becca_lawn

http://www.bristol.ac.uk/expsych/research/brain/targ/

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