Examining the size of the gender wage gap within and across birth cohorts

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Alex Bryson
UCL

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Project Overview

- Began September 2019 ends February 2023
- (Mainly) birth cohort data to explore the gender wage gap across cohorts and over the life-course
  - Plus some papers with linked employer-employee data
- Examines GWG across individuals' lives, up to the age of 60+ in the case of the 1958 cohort, and across generations
- The UCL team:
  - Alex Bryson (PI)
  - Heather Joshi (co-investigator)
  - David Wilkinson (co-investigator)
  - Francesca Foliano (Research Fellow)
  - Bozena Wielgoszewska (Research Fellow)
- All information on the project can be found here: https://www.ucl.ac.uk/ioe/departments-and-centres/departments/social-science/gender-wage-gap-evidence-cohort-studies

Research Questions

1. What does the GWG look like ***over the life course and across birth cohorts***?
2. How much of the GWG is accounted for by differences in ***human capital accumulation*** over the life course?
3. What roles do family formation and ***care responsibilities*** play in the emergence of, and persistence in, the GWG?
4. How much of the gender wage gap is attributable to the ***sorts of jobs*** undertaken by men and women, particularly in relation to full-time/part-time status and occupation? Do these point to mechanisms through which unequal pay for equal characteristics arises?
5. What role do ***early childhood attributes and experiences*** play in determining the subsequent wage gap between men and women and do childhood influences still matter having accounted for early adulthood experiences?

Data

National Child Development Survey (NCDS): a cohort of over 17,000 individuals born in one week in 1958 in Great Britain. They have been surveyed nine times to the age of 55 and, given the length of the proposed project, we will be able to follow them through to age 61 (Sweep 10).

The **British Cohort Survey (BCS)**: a cohort of over 17,000 individuals born in one week in 1970. They have been surveyed 10 times to the age of 47. Data for Great Britain

Next Steps, (previously the Longitudinal Study of Young People in England) which, in 2004, started surveying all young people in Year 9 who attended state and independent schools in England (around 16,000 individuals born in 1989/90). They were surveyed every year until 2010 and were last surveyed in 2015/16 for Sweep 8 at age 25.

National Survey of Health and Development: 1946 Birth Cohort (GB)

Millennium Cohort Study (MCS): a cohort of 19,000 individuals born in UK 2000-2002. Now aged 20.

All participated in the **COVID-19 Survey**: 3 waves (May 2020, Sept/Oct 2020, Feb/Mar 2021) https://cls.ucl.ac.uk/covid-19-survey/

Pseudo birth cohorts: LFS, ASHE, Understanding Society, BHPS

Why Birth Cohort Data?

1. Different cohorts are exposed to different labour market and policy conditions during their lifetimes.
2. For instance, the 1958 cohort left school when the Equal Pay Act was first being implemented whereas the Act had been in place for a decade when the 1970 cohort left compulsory education.
3. The education gap between men and women has disappeared and even reversed, such that we would expect the pay gap due to educational differences to narrow or even reverse in more recent cohorts.
4. Attitudes to women's labour market participation and men's household production have shifted. These changes in social norms, together with attendant changes in public policy, have created opportunities for men and women to combine paid and unpaid work and leisure in ways not hitherto possible, with uncertain consequences for the life choices and earnings patterns of men and women across the life-course.

Methods

By analysing nationally representative birth cohort data for people born in 1958, 1970 and 1989/90 this study addresses the topic from three angles:

1. We consider the evolution of the GWG over the whole life-course. This is important because factors governing both selection into employment and wage determination vary for men and women well into later life.
2. Because we track people from birth, we obtain a picture of the links between childhood circumstances, skills and experiences and subsequent earnings for men and women - and thus the size of the wage gap.
3. We distinguish between the effects of ageing and birth cohort, something that is only possible with data tracking multiple birth cohorts.

Methodological Challenges

- Selection into employment: over the life course and across cohorts
- Panel attrition
- Imputation to tackle data missingness/item non-response
- Consistency in dependent variable
- Consistency in independent variables
- ‘Bad’ controls
- Common support problems
- Cross cohort comparison

Some Background

100 Years of the GWG

Table 1: Raw gap between female and male mean hourly earnings as a proportion of male hourly earnings (except column 2 which uses weekly earnings)

Year	1 Full-time manual employees	2 Full-time manual employees (weekly)	3 All employees	4 Full-time employees	5 Part-time employees
1921	0.53	–	–	–	–
1931	0.53	–	–	–	–
1941	0.46	0.56	–	–	–
1951	0.38	0.45	–	–	–
1961	0.40	0.50	–	–	–
1971	0.40	0.48	–	0.37	–
1976	0.30	0.40	–	0.27	–
1981	0.31	0.39	–	0.27	–
1991	–	0.37	–	0.22	–
2001	–	–	0.25	0.20	0.10
2011	–	–	0.19	0.16	0.09
2018	–	–	0.17	0.14	0.08

Notes: Column 1 derived from Joshi *et al.* (1985, Table 6). Column 2 based on Department of Employment Labour Statistics for average gross weekly earnings in series 0063011938to2018meantimeseries.xls. Columns 3–5 based on New Earnings Survey/Annual Survey of Hours and Earnings mean gender pay gap series 006331nesandashegenderpaygaptimeseries.xls. Until 1981 based on men aged 21+ and women aged 18+, then those on 'adult rates'.

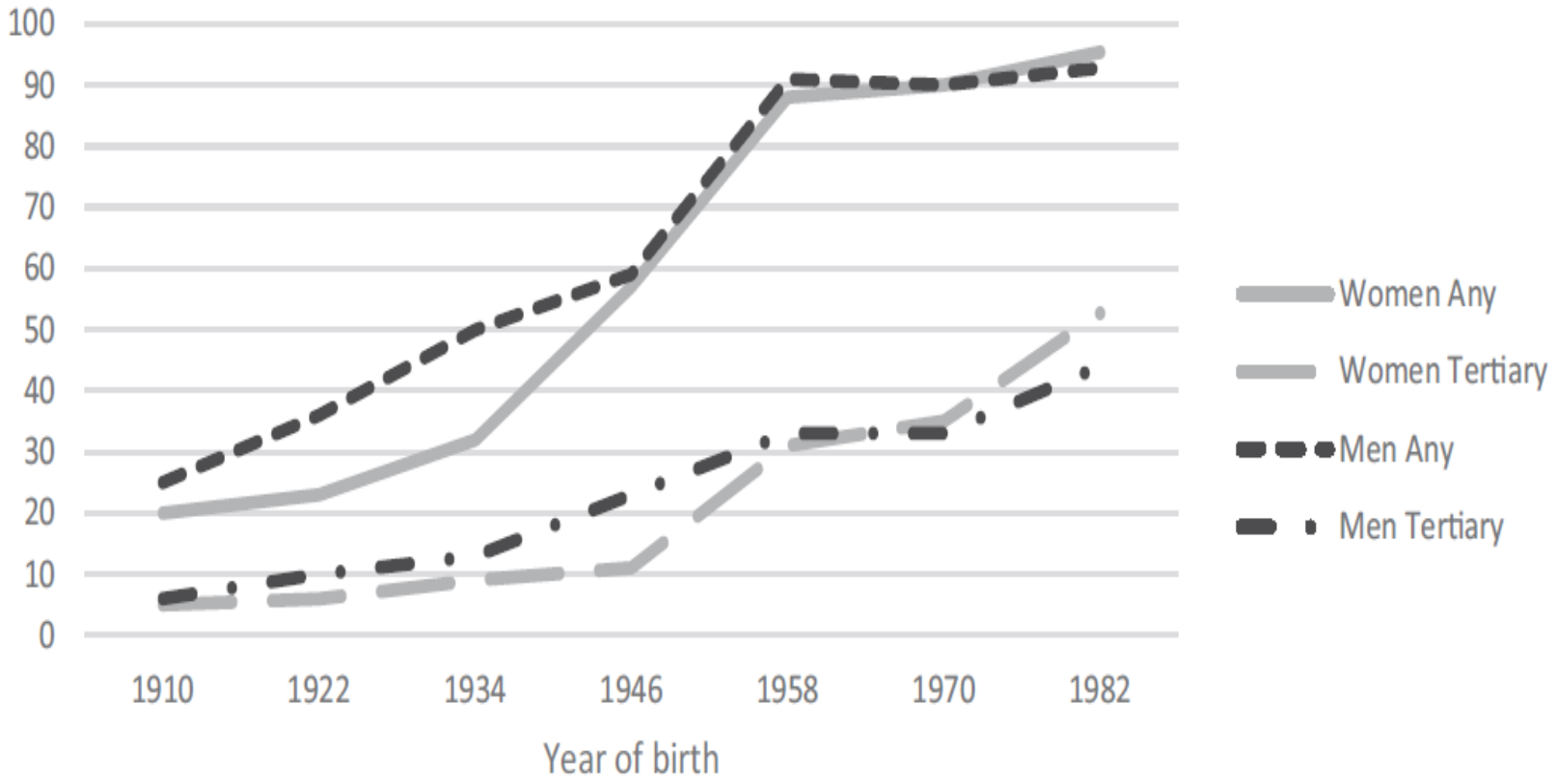
100+ Years of Women's Economic Activity

Table 2: Women's labour market activity rates

Census year	1 All	2 All—LFS	3 Married	4 Married—LFS	5 Single/divorced/ widowed	6 Single/divorced/ widowed—LFS
1871	34.5					
1891	33.5					
1911	32.5					
1931	31.6		10.9		66.7	
1951	36.3		23.2		70.0	
1961	41.0		31.6		73.3	
1971	51.5		45.9		72.7	
1981	57.7		54.0		68.9	
1991	64.0	69.0	62.3	68.0	66.6	72.4
2001	67.9	70.1		69.0		71.7
2011	73.6	72.1		70.3		74.3
2019		77.3		75.6		79.0

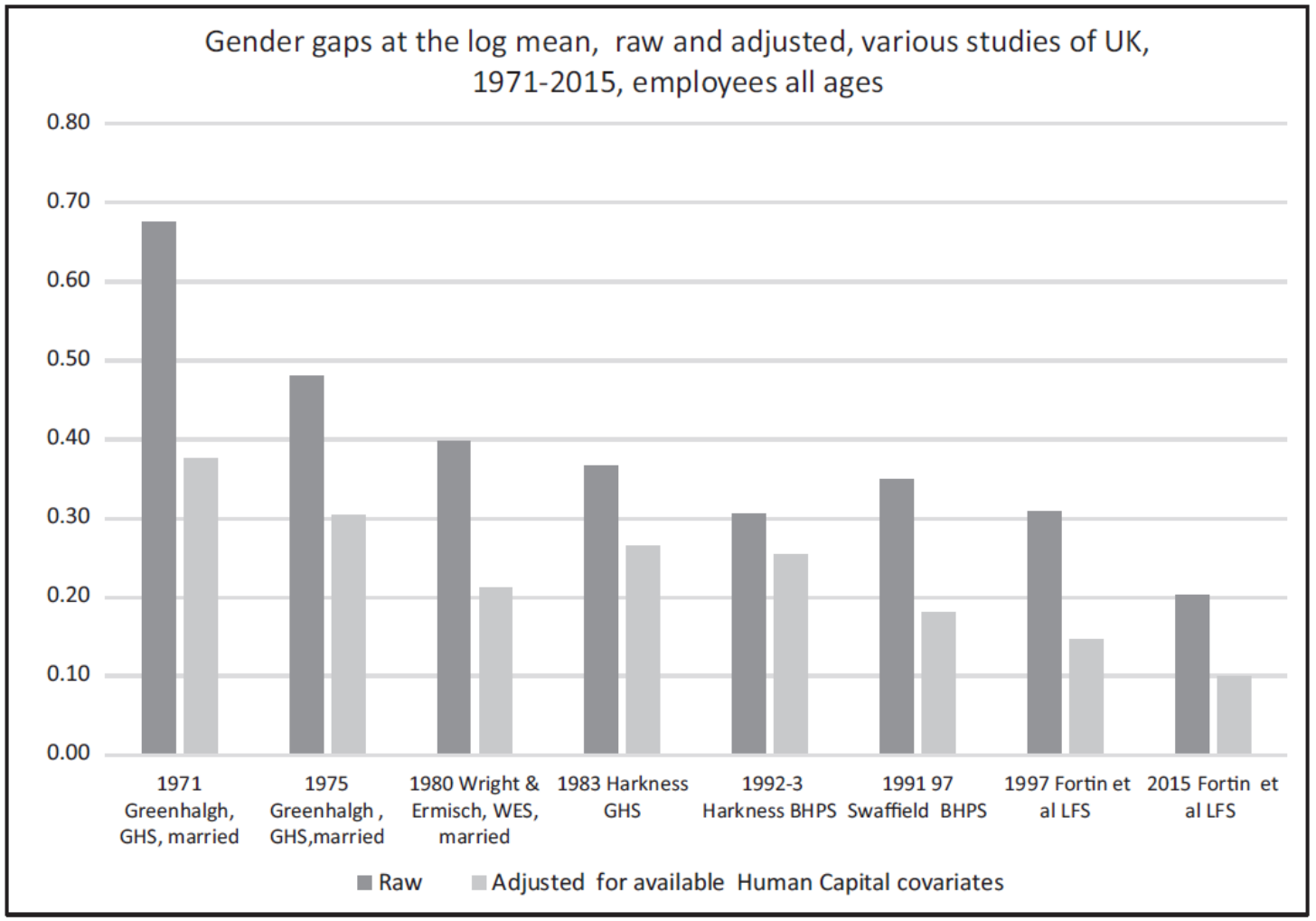
Educational Attainment

Figure 1: Percentage of men and women in their early 30s with qualifications, by cohort



Gradual Closure of the GWG

Figure 2: Log gender wage gaps in selected UK studies adjusting for human capital



Research Questions for Today

What does the GWG look like across the life-course in NCDS and BCS?

- How much smaller is the regression-adjusted gap compared with the raw gap?
- Does accounting for selection and attrition matter?

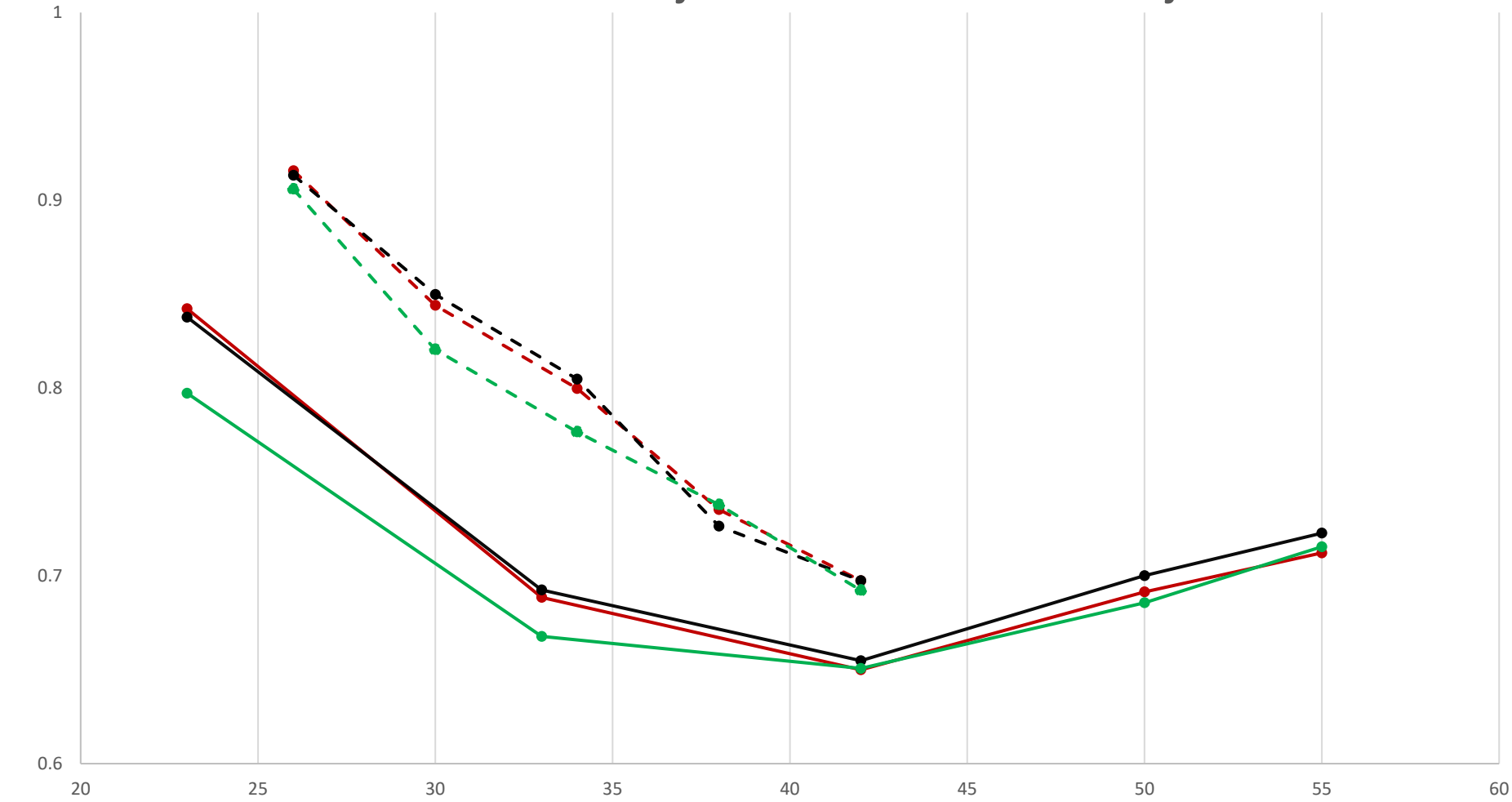
What does the GWG look like among young people and how has this changed over time?

What does the GWG look like in mid-life? Has it changed much across birth cohorts?

What happened during the Covid-19 Pandemic?

What does the GWG look like across the life-course in NCDS and BCS?

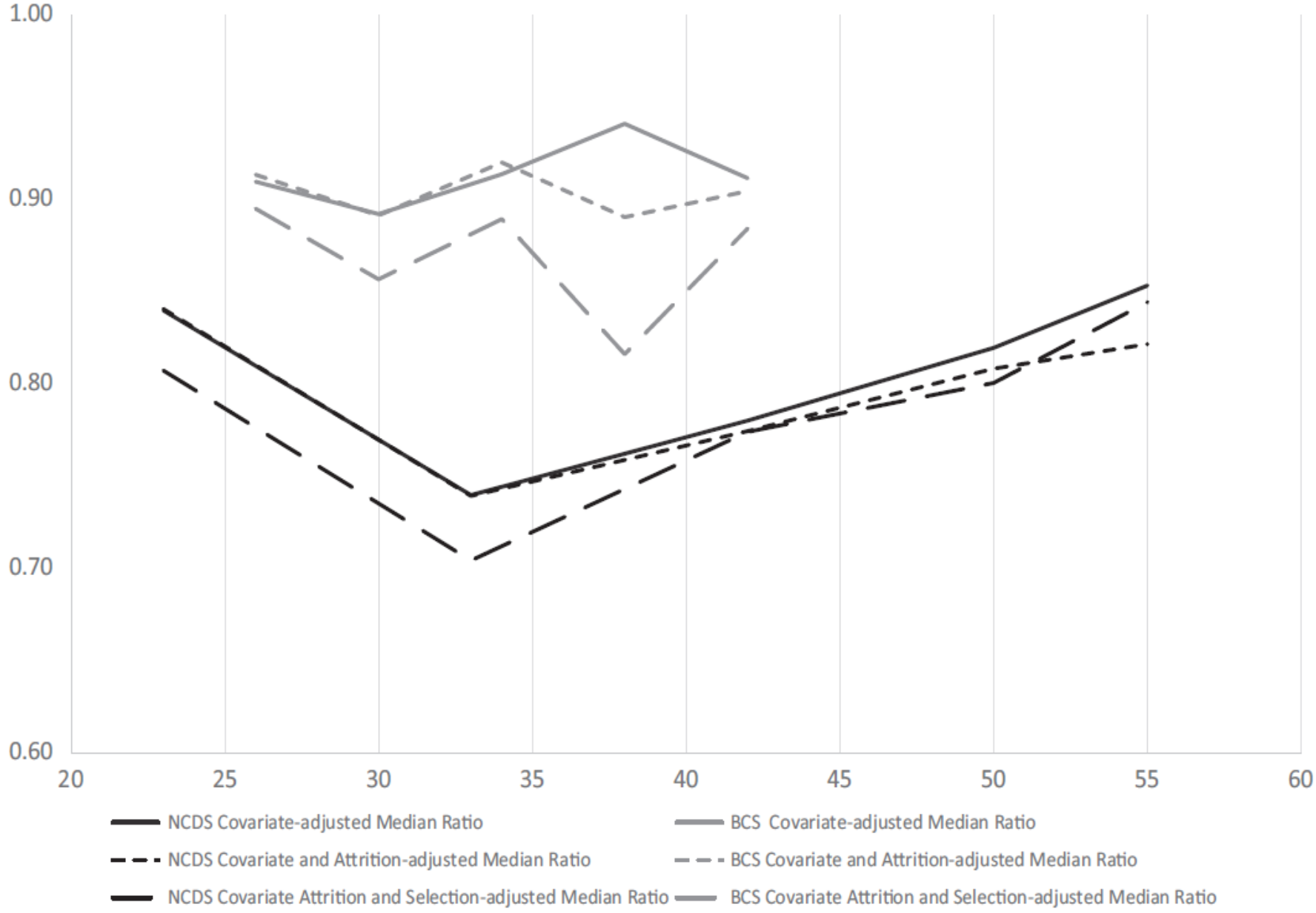
Raw female-to-male ratios of median pay, by survey attrition adjusted and selection adjusted



Findings for Raw GWG

1. The GWG grows until mid-age then falls
2. The GWG is smaller across the life-cycle in BCS v NCDS
   - Raw, attrition adjusted and selection adjusted
3. Results are not particularly sensitive to attrition adjustment
   - The black lines track the red lines
   - Attrition adjustment closes the GWG a little later in life in NCDS
4. Adjusting for selection into employment plays a small, albeit significant, role in the size of the GWG over the life-cycle
   - Adjusting for selection into employment increases the size of the GWG in early life in both NCDS and BCS

Figure 4: Female-to-male ratios of median pay, covariate-adjusted by survey



Findings for covariate-adjusted GWG

1. NCDS
   - Life-course pattern of GWG similar to that for raw gap, but gap begins to close in 30s not 40s
   - Gap is less pronounced than raw gap due to human capital differences in 30s and 40s
   - Accounting for attrition gap is larger later in life
   - Selection-adjustment means gap is larger until 40s
2. BCS
   - GWG much flatter between 20s and 40s when covariate adjust due to human capital differences
   - GWG always smaller than in case of NCDS
   - GWG smaller with selection-adjustment

What does the GWG look like in mid-life?

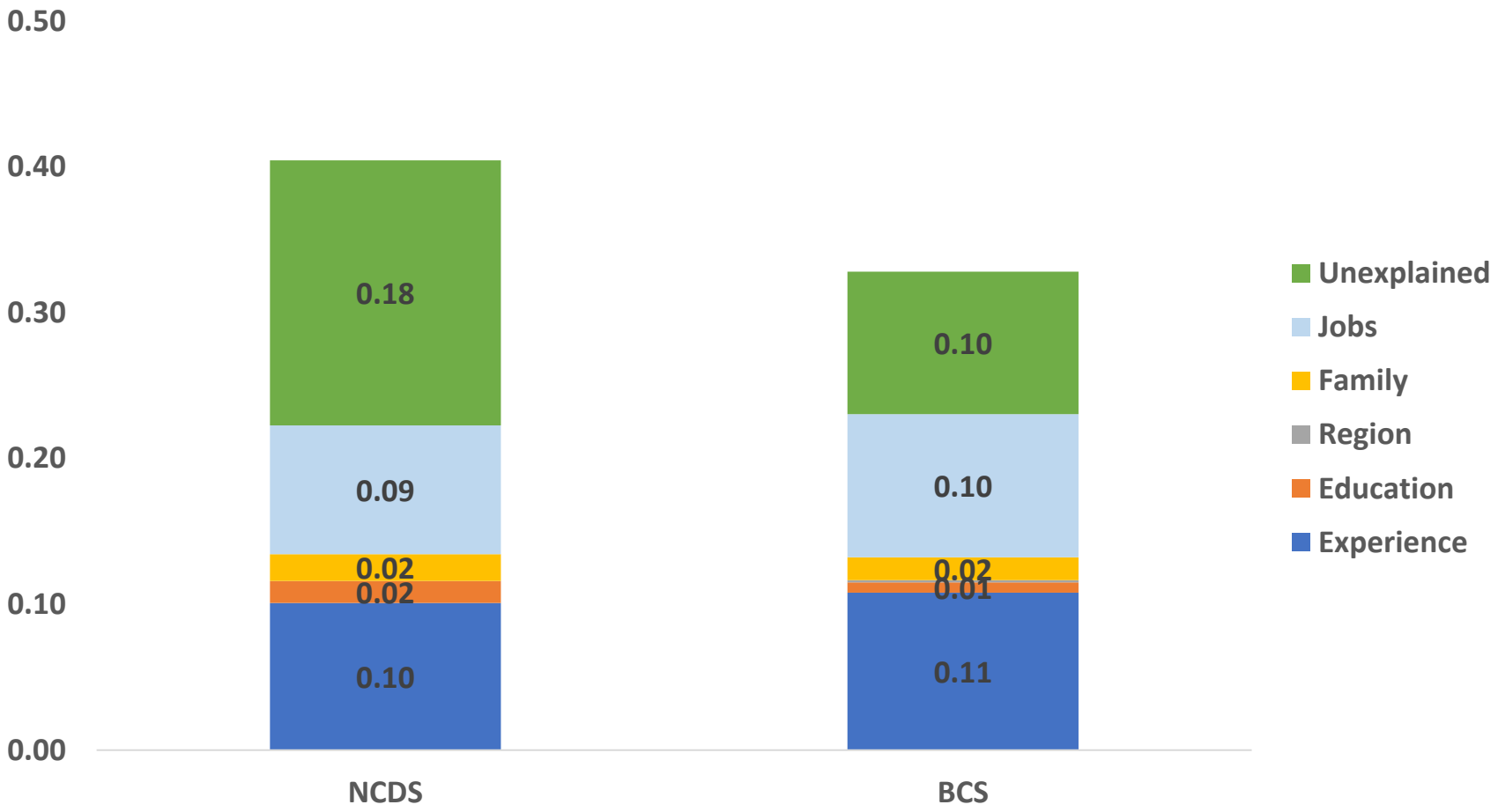
Previous work (OXREP paper) – mostly focused on human capital

- GWG fell at age 42 from 0.40 to 0.33 log points between 2000 and 2012
  - more education and full-time work experience acquired by women
- Roughly 55% accounted for by differences in characteristics in both years
  - full and part-time experience, education, job tenure and region
- Most of this was due to differences in full-time experience (62% in 2000, 82% in 2012)
- Returns to qualifications favoured men in 2000, but not in 2012.

Updates

- Explore the role of family and job characteristics in accounting for the GWG
  - Can we account for more of the gap?
  - Do the earlier finding still hold?
- Family
  - Whether have a partner,
  - Whether ever had a child
  - Whether currently have children aged <3, 3-4, 5-15
- Job characteristics
  - Occupation (1 digit SOC)
  - % of women by occupation (2 digit SOC)
  - Whether work part-time
  - % of part-time workers by occupation (2 digit SOC)

Gender Wage Gap at age 42- unexplained and explained components



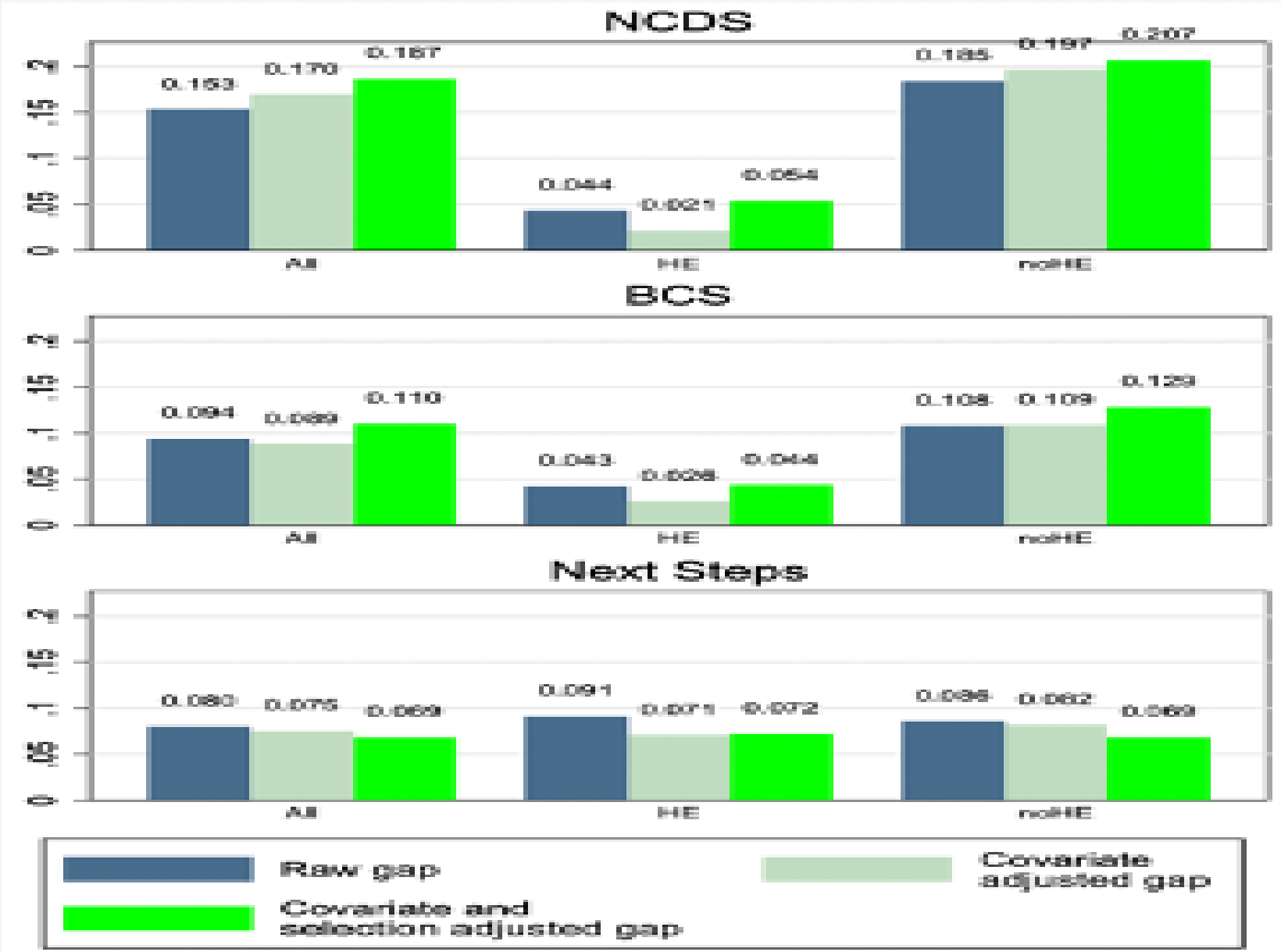
Raw gap in log mean hourly wage is 40% in NCDS and 33% in BCS (similar to the 35pp and 31pp gap in median wages on slide 15)

What does the GWG look like among young people and how has this changed over time?

Findings

- The GWG adjusted for human capital and childrearing falls by more than half between 1981 and 2015
- The GWG increases for those with HE and it halves among those without HE
- Whereas selection adjustment increases the size of the GWG in 1981 and 1996 it does not affect the gap in 2015
- Differences in human capital and marital/parental status account for a small portion of the gap. The nature of jobs (occupation, gender segregation) accounts for a sizeable part of the explained GWG in the most recent cohort.

GWG Among Young Workers



The role of occupation

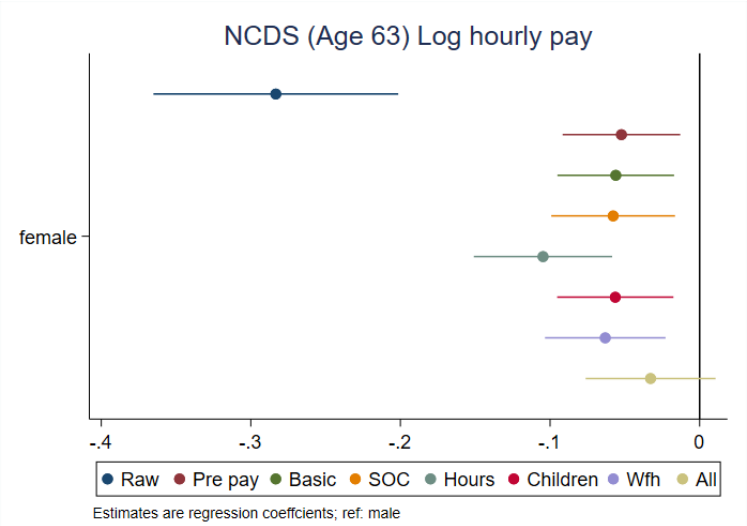
- Traditionally hard to account for much of the GWG with observed information, leaving an 'unexplained gap' often attributed to unequal treatment/ discrimination.
- Similar here
  - Very little of the gap is explained by differences in human capital attributes and marital/parental status
  - But occupation matters
- For individuals with observed wages (and occupations) we estimate the contribution of type of occupation (SOC 1 digit), proportion of women in the occupation and whether the job is high-skilled to the gender wage gap.
- Proportion of women in the occupation explain some additional part of the gap in 1981 and 1996 and most of the gap in 2015.

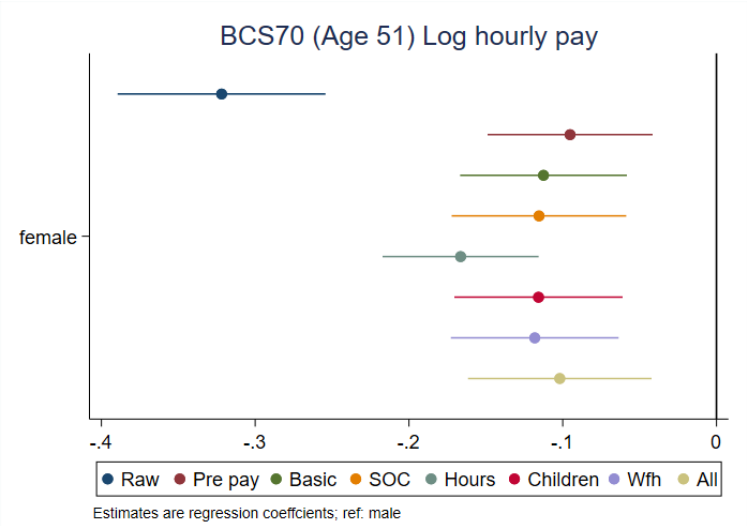
What happened to the GWG during the COVID-19 pandemic?

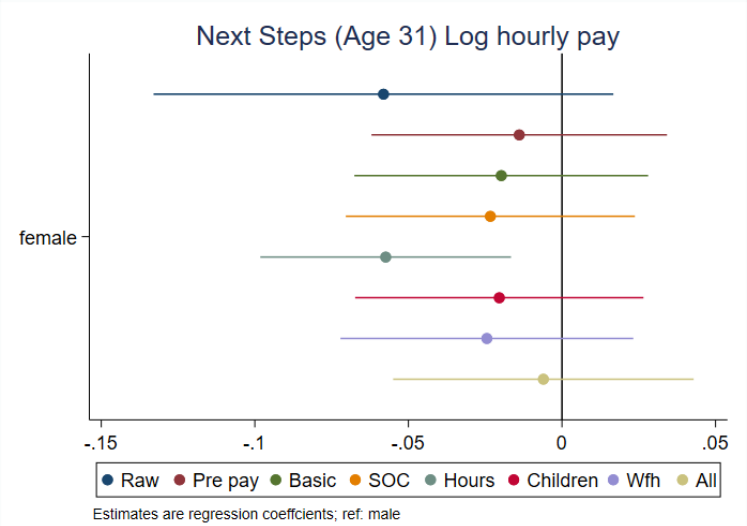
Motivation

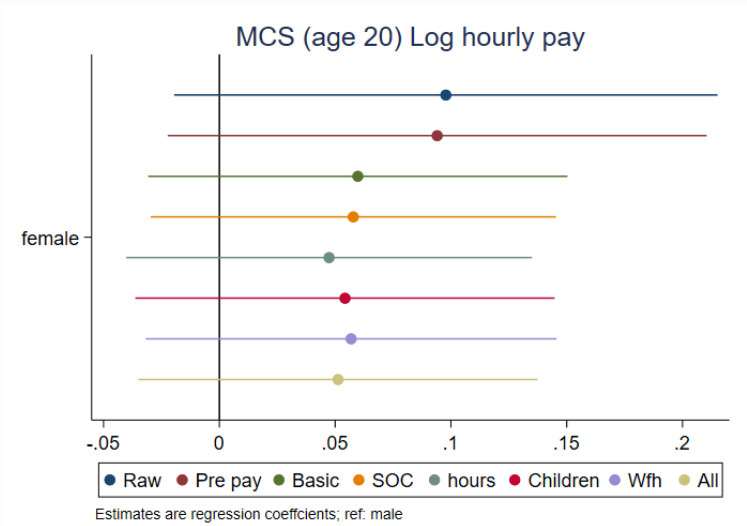
- Wielgoszewska et al (forthcoming) find that in terms of employment adverse effects are still experienced by women a year into the covid pandemic, especially if they live with partners and children
- …but what about those who remained in employment?

- Research questions:
  - Has the pay gap between men and women changed during COVID?
  - If so did this differ across different generations?


NCDS (Age 63) Log hourly pay
female
-.4
-.3
-.2
-.1
0
Raw
Pre pay
Basic
SOC
Hours
Children
Wfh
All
Estimates are regression coeffcients; ref: male


BCS70 (Age 51) Log hourly pay
female
-.4
-.3
-.2
-.1
0
Raw
Pre pay
Basic
SOC
Hours
Children
Wfh
All
Estimates are regression coeffcients; ref: male


Next Steps (Age 31) Log hourly pay
female
-.15
-.1
-.05
0
.05
Raw
Pre pay
Basic
SOC
Hours
Children
Wfh
All
Estimates are regression coeffcients; ref: male


MCS (age 20) Log hourly pay
female
-.05
0
.05
.1
.15
.2
Raw
Pre pay
Basic
SOC
hours
Children
Wfh
All
Estimates are regression coeffcients; ref: male

Future Work

- Completion of on-going papers:
  - GWG among young people
  - Decomposing the GWG at age 42
  - The GWG during COVID
  - Convergence in the GWG among university Vice Chancellors (under review)
  - The effects of female managers on the GWG (under review)

- Upcoming papers
  - Occupational aspirations
  - Sequence analysis
  - Meta-analysis (with Patrice Laroche)
  - Use of matching estimators for the GWG
  - Do genetic factors play any role in the GWG?

Detail on Some of the Issues Discussed

Bryson, A., Joshi, H., Wielgoszewska, B. and Wilkinson, D. (2020) "A Short History of the Gender Wage Gap in Britain", *Oxford Review of Economic Policy*, 36, 4: 836-854

Supplementary Appendix to Bryson et al 2020

Joshi, H., Bryson, A., Ward, K. and Wilkinson, D. (2021) "The Gender Gap in Wages over the Life Course: Evidence from a British Cohort Born in 1958", *Gender, Work & Organization*, 28: 397-415