

DISCUSSION PAPER SERIES

IZA DP No. 14616

**Teenage Conduct Problems: A Lifetime of
Disadvantage in the Labour Market?**

Sam Parsons
Alex Bryson
Alice Sullivan

JULY 2021

DISCUSSION PAPER SERIES

IZA DP No. 14616

Teenage Conduct Problems: A Lifetime of Disadvantage in the Labour Market?

Sam Parsons

UCL

Alex Bryson

UCL and IZA

Alice Sullivan

UCL

JULY 2021

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ISSN: 2365-9793

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Teenage Conduct Problems: A Lifetime of Disadvantage in the Labour Market?*

Using data from two British birth cohorts born in 1958 and 1970 we investigate the impact of teenage conduct problems on subsequent employment prospects through to age 42. We find teenagers with conduct problems went on to spend fewer months both in paid employment, and in employment, education and training (EET) between age 17 and 42 than comparable teenagers who did not experience conduct problems. Employment and EET disadvantages were greatest among those with severe behavioural problems. The 'gap' in time spent in employment or EET by conduct problem status was similar for men and women across cohorts, with only a small part of the gap being attenuated by differences in social background, individual characteristics and educational attainment in public examination at age 16. We discuss the implications of our findings.

JEL Classification: I12, J20, J64

Keywords: behavioural problems, Rutter, labour market, employment, education, training, disadvantage, educational attainment

Corresponding author:

Sam Parsons
Social Research Institute
UCL
Gower St
London WC1E 6BT
United Kingdom
E-mail: sam.parsons@ucl.ac.uk

* We thank the Health Foundation (grant no. 546608) for funding and George Ploubidis for his comments on an earlier version of the paper

1. Introduction

People with behavioural or mental health problems experience high levels of stigmatisation and discrimination (Corker et al, 2013; Mehta et al, 2009; Henderson and Thornicroft, 2009) and face substantial economic disadvantage. Having behavioural problems or low mental wellbeing in childhood can cast a long shadow on a wide range of outcomes over the life-course, including educational attainment, employment, wages, income and early mortality (Egan, Daly and Delaney, 2015; Goodman et al, 2011; Palloni, 2006; Parks et al, 2006).

We revisit this issue, concentrating on the impact of teenage conduct problems on time spent in employment, and time spent in employment, education and training (EET), between ages 17 and 42. We do so using birth cohort data from two generations born in Britain 12 years apart in 1958 and 1970 where conduct problems were measured in an identical fashion. A priori, we might anticipate negative effects of conduct problems on subsequent labour market experiences in both cohorts, in part because those conduct problems might directly influence labour market success – if, for example, they persist into adulthood and affect workers’ job search, job offers, work relationships or productivity – and indirectly via educational attainment. We hypothesise that these effects will persist having accounted for potential confounding effects due to social background and other individual traits.

We contribute to the literature in four ways. First, we are the first to look at the cumulative effect of childhood behavioural problems on subsequent labour market experiences through to age 42 – what might be thought of as maturity in the labour market. Second, we show how labour market disadvantage associated with childhood behavioural problems develops over the life-course. Third, we are the first to compare effects across generations, taking advantage of identical measures of conduct problems in two birth cohorts (Richards et al., 2009; Rutter, 1970). Fourth, in contrast to previous research we use quantile regression to compare effects of conduct problems at the .25 .50 and .75 centiles of the labour market experience distributions. This is important given the distribution of time spent in employment and EET in the data, and because the effects of conduct problems differ in different parts of the distribution of labour market experience.

The remainder of the paper is structured as follows. Section Two reviews the existing literature; Section Three describes the data before detailing our key measures in Section Four and presenting the results in Section Five. A discussion of results follows in Section Six, including implications for policy and limitations of the study.

2. Previous literature

2.1: Prevalence of adolescent behaviour and mental health problems

Increasing numbers of children and young people experience behavioural and mental health problems (Green et al., 2005; Smith and Smith., 2010; Pitchforth et al., 2014; Patalay and Gage, 2019). Roughly one in eight children and young people in the UK have mental health problems (NHS Digital, 2018) and psychiatric disorders in young people are increasingly prevalent (Collishaw et al., 2004; Borschmann et al., 2017; Borschmann and Kinner., 2019). As the literature often treats behavioural and mental health problems synonymously, we include research that refers to both in the review below but focus on conduct or antisocial problems when looking at the relationship with economic activity. In the birth cohorts, participants have emotional and behavioural problems assessed using established scales during childhood and adolescence (e.g. Rutter, 1970; Goodman 1997, 2001) and mental wellbeing assessed from early adulthood (Rutter, 1970; Kessler, 2003).

2.2: Association with labour market participation

Studies examining the relationship between conduct problems and economic activity suggest behaviour problems in childhood lead to greater risk of unemployment and joblessness in adulthood. The literature uses antisocial, conduct and behaviour problems interchangeably, but the measures are based on the Rutter scale question responses (discussed later) either independently or in conjunction with responses to other questions.

Richards et al (2009) find that in both the 1958 and 1970 cohorts we examine mild and severe adolescent conduct problems were associated with significantly elevated odds of experiencing a period of chronic economic inactivity.

Using the 1970 birth cohort Feinstein (2000) found antisocial behaviour at age 10 predicted unemployment of at least 4 months by age 26. Among those with at least 4 months unemployment it also predicted long-term unemployment (of 12 or more months), but only for men. The gender difference was also apparent in the study by Knapp et al. (2011) which used the same 1970 birth cohort: men with antisocial behaviour problems were less likely to be economically active at age 30 compared to men without such problems, but this was not found among women. Using the same dataset, Clark and Lepinteur (2019) found behaviour problems at age 16 were associated with unemployment at age 30 and the total amount of unemployment experienced up to age 30 for both men and women. Differences in results across these studies may reflect differences in the way behaviour problems were derived, the age of at which behaviour problems were recorded, or the age at which labour market outcomes were assessed.

Research using other data sources also finds an association between behavioural conduct problems and subsequent poor labour market outcomes. For instance, Healey et al. (2004) analysed the Cambridge Study in Delinquent Development (CSDD; Farrington, 1995) and found men identified with antisocial 'troublesome' traits at an early age experienced long periods of time out of the workforce up to age 32 (this research did not include women). Kokko and Pulkkinen (2000) found aggressive behaviour at age eight was associated with long-term unemployment between age 27 and 36 in Finland. In New Zealand, anti-social behaviour measured via the Rutter Scale questions between age 7-9 years was found to increase the risk of youth unemployment between age 15 and 21 (Caspi et al, 1998). Conduct behaviour problems measured at age 11 via the Strengths and Difficulties scale (itself based in part on the Rutter Questionnaire, see Goodman 1997; 2001) were associated with being not in education employment or training (NEET) in early adulthood (age 22) in both England and Brazil (Hammerton et al, 2019).

Not all studies conclude that conduct problems affect subsequent labour market outcomes. Two studies find the association between conduct problems and unemployment is completely attenuated when controlling for confounding factors. Using the same longitudinal dataset as Caspi et al. (1998), but at a later time point,

Ferguson et al. (2005) found those with conduct problems in New Zealand had no greater experience of being unemployed for a 12-month period between age 21 and 25. They did find a raw correlation, but this was largely explained by the strong relationship between conduct problems, IQ and attentional problems which were themselves strongly associated with unemployment. The second study by Colman et al (2009) used data from the 1946 British cohort study and found those with mild or severe conduct problems in adolescence were no more likely than their peers to have experienced one episode of unemployment at age 36, 43 or 53. However, when including interaction terms between conduct problems and sex, they did find some evidence to suggest men with severe conduct problems were more at risk of having been unemployed.

Taken together, these studies suggest behaviour problems in childhood or adolescence are negatively associated with economic activity through adulthood, with the effects being clearer in the case of men.

3. Research Questions

Our paper uses longitudinal data from two birth cohorts born 12 years apart and adopts a life-course perspective to examine the role of conduct problems in adolescence on employment and EET through to age 42. Using identical measures of conduct problems (Rutter, 1970), and exploiting detailed economic activity history data in the 1958 National Child Development Study (NCDS) and the 1970 British Cohort Study (BCS70) we explore how conduct problems relate to months spent in employment or employment, education and training (EET) between age 17 and age 42. Specifically, we ask:

- 1) Do those identified with conduct problems in their teens spend less time in employment or EET than their counterparts without identified conduct problems?
- 2) How much of any gap in time spent in employment or EET between those with and without conduct problems is attenuated by educational qualifications, family background and individual characteristics?
- 3) Does any association between conduct problems and employment or EET vary across the distribution of labour market outcomes?
- 4) How does the association vary across the two cohorts?

- 5) How does any labour market disadvantage associated with conduct problems develop over the life-course?

Given some studies have shown conduct problems relate differently to labour market participation by sex in the 1970 cohort (Feinstein, 2000; Knapp et al. 2011) and that the relationship with labour market participation has strengthened for women born in 1970 compared to women born in 1958 (Bryson et al. 2020), we analyse these relationships for men and women separately.

4. Data and samples

4.1: The 1958 National Child Development Study (NCDS)

The 1958 cohort follows all those born in one week in England, Scotland and Wales in 1958 (Power and Elliott, 2006; <http://www.cls.ucl.ac.uk/ncds>). We use data collected at birth and in the subsequent three follow up surveys from parents and cohort members when participants were aged 7, 11 and 16, as well as labour market outcome data also collected at ages 23, 33 and 42 (University of London, 2020a, 2020c).

4.2: The 1970 British Cohort Study (BCS70)

The 1970 cohort follows the lives of more than 17,000 people born in England, Scotland and Wales in one week of 1970 (Elliott and Shepherd, 2006; <http://www.cls.ucl.ac.uk/bcs70>). We use information from the first four waves, from parents and cohort members when they were aged 0, 5, 10 and 16, together with labour market outcome data also collected at ages 30, 34, 38 and 42 (University of London, 2013, 2016a, 2016b, 2020b, 2021).

4.3: Missing data

Given the potential for biases arising due to differential sample attrition among those with behaviour problems we use multiple imputation with chained equations (White, Royston and Wood, 2011) to provide complete information for all those who were both included in the original birth surveys and were still alive at age 42 (n=16,238 in NCDS; n=16,129 in BCS70). We adopt Schafer's data augmentation approach (Schafer, 1997) under the assumption of 'missing at random' (MAR). To maximise the plausibility of the MAR assumption we included a large set of auxiliary variables in our imputation model. In this instance MAR implies that our estimates are valid if missingness is due to variables

(auxiliary or substantive) that were included in our models (Mostafa et al., 2020; Silverwood et al., 2020). All reported analyses are averaged across 20 replications based upon Rubin’s Rule for the efficiency of estimation under a reported degree of missingness across the whole data of around 0.20 (Little and Rubin, 2014). Analyses were carried out in Stata 16 (Statacorp, 2019).

4.4: Conduct behaviour problems

We measure conduct behavioural adjustment at age 16 in both studies using the Rutter *parental questionnaire, or Child Scale A* (Rutter et al, 1970; Elander and Rutter, 1996). In total the scale comprises 31 descriptions of behaviour in three sections. Behavioural adjustment is measured on a three-category scale: Does not apply (0), Applies somewhat (1) and Certainly applies (2). Table 1 details the five (near) identical conduct behaviour questions.

Table 1 here

After running exploratory factor analysis (EFA) in MPlus (version 8, Muthén and Muthén, 2017) on the five items, we tested whether parents in both cohorts interpreted a question in a conceptually similar manner by checking for measurement invariance. We found both metric and scalar invariance which allows us to compare both regression coefficients of associations between conduct problems and time in employment or EET and to compare mean conduct scores across cohorts.

We derived harmonised conduct scales for both cohorts by summing scores across questions, with a high score indicating higher problems. Scores ranged from 0-10 with a mean score of 0.63 in NCDS and 0.80 in BCS70. Individuals are categorised into those with no problems, 1 or 2 problems (“minor”) or 3 or more problems (“severe”). Table 2 shows the distribution across conduct behaviour groups by cohort and sex. Appendix Table A1 presents the measurement invariance results.

Table 2 here

4.5: Time in Education, Employment and Training (EET)

We used economic activity history data to calculate the number of months an individual spent in employment or employment, education or training (EET) over the 26 years

from January at the start of the calendar year they turned 17 to December of the year they turned 42. For the 1958 cohort this was January 1975 to December 2000 and for the 1970 cohort, January 1987 to December 2012: a total of 312 months. We included a measure of time spent in EET as well as employment to account for the age an individual entered the labour market after leaving education and training, and the different labour market conditions faced by the two generations of school leavers.

As expected, men spent, on average, more of the available 312 months in employment compared with women in both cohorts, with women in the 1970 cohort spending more time in employment compared to women in the 1958 cohort (Table 3). When months in education and training was also taken into account, women in the 1970 cohort had spent, on average, 13 months more time in EET than women in the 1958 cohort, although there was more variation for women in the more recent cohort. This reflects the changes between cohorts, not only in women's increased attachment to the labour market, but also in the delays in childbirth and a reduction in the average number of children women had in the more recent cohort (Bryson et al, 2020). Men in the more recent 1970 cohort had spent, on average, 12 months less time in employment than the earlier cohort. The mean number of months men spent in EET was similar across cohorts, although again there was more variation among those in the younger cohort.

Table 3 here

4.6: Other child and family characteristics

In our analyses we include a wide range of individual and family-background characteristics that our review of the literature has shown to be associated with both behaviour problems and labour market outcomes. This enables us to identify how far any labour market disadvantage is driven by lower qualifications, disadvantaged personal characteristics or social origins, thereby helping to establish any potential causal impact of conduct problems on labour market participation. The individual characteristics are gender, birthweight, birth order, breastfeeding and reading and maths test scores in mid-childhood. Measures of family socio-economic circumstances are taken from the birth survey, or if not available, from when the measure was first asked. This included parental occupation social class and age leaving full-time education, housing tenure, overcrowded living conditions and family income.

Previous research has shown that those with conduct problems are more likely to fall behind academically in childhood and achieve fewer qualifications at school leaving (Colman, et al. 2009; McLeod et al. 2012; Sayal et al. 2015). This raises the question of how far any impact of conduct problems in childhood are attributable to their impact on educational disadvantage. We therefore also incorporate educational attainment by age 16 using public examination results which were collected from official records for NCDS cohort members and, for BCS70, from parents in 1986 and cohort member themselves when age 30 or 34. Members of both cohorts in England and Wales sat either Ordinary Level (O Level) or Certificate of Secondary Education (CSE) exams at age 16, those in Scotland Ordinary Grade (O Grade) exams. We calculated the total number of 'good' O Level (Grade A-C), CSE (Grade 1) or O Grade (Grade A-C) that a cohort member achieved and also if they had achieved a good pass in English and Maths.

4.7: Analytic strategy

We start by describing differences in the individual and family characteristics of those with and without conduct problems across the two cohorts and then present the mean number of months spent in employment and EET by each of these characteristics. Given the highly skewed distribution in our months spent in employment or EET (see Table 3 and Appendix A2) we use quantile regression methods to compare differences in the number of months spent in employment and EET between age 17-42 by conduct status across the distribution of employment outcomes thereby increasing the power to detect differences in the upper and lower tails. We compare differences both within and across the two cohorts at the .25 .50 and .75 centiles.

5. Results

5.1: Descriptives

Appendix Tables A 3.1 (NCDS) and A 3.2 (BCS70) show the differences in individual and family characteristics according to whether cohort members had no behavioural problems in childhood, one or two, or three or more, for men and women separately. For men and women in both cohorts, those with severe conduct problems were more likely to have been a low birthweight baby, to have lower scores on average in reading and maths tests in mid-childhood and to have achieved fewer good grade exam passes at age 16. Fewer had a mother who had experienced extended education or worked in a

non-manual occupation, and more lived with a single parent in rented or crowded accommodation on a lower family income.

In Appendix Tables A4.1 (NCDS) and A4.2 (BCS70) we see that men and women with conduct problems in both cohorts had spent less time in employment or EET compared to their peers with no problems and that the 'gap' was widest for those with severe problems and widest of all for women in BCS70. Amongst men the employment gap between those with no conduct problems and those with three or more was around two years (22 months NCDS; 26 months BCS70). This was similar for women in the 1958 cohort (25 months), but the gap was three years for women in the 1970 cohort. Turning to EET, the 'gaps' are larger. Among men, those with severe conduct problems had 30 fewer EET months than men with no behavioural problems in NCDS, a gap that rose to 35 months in BCS70. Among women the gaps were 36 and 45 months, respectively.

5.2: Regression results

We estimate a series of quantile regression models for months spent in 1) employment and 2) EET and their association with teenage conduct problems. Our model 1 specification presents the raw correlation. Model 2 adjusts for family socioeconomic background. Model 3 incorporates teenagers' individual characteristics while model 4 also controls for public examination results at age 16. We compare differences both within and across the two cohorts at the .25 .50 and .75 centiles. Results for months spent in employment are shown in Table 4 (men) and Table 5 (women); months spent in EET in Table 6 (men) and Table 7 (women).

5.2.1: Employment

Conduct problems in childhood are associated with less time in employment in all models and in all cases the effect rises with the severity of the conduct problems.

Tables 4 and 5 here

Table 4 shows the independent association between conduct problems in childhood and time spent in employment between age 17 and 42 among men in NCDS (top panel) and BCS (bottom panel). In this and subsequent tables we present the four models

described above and capture the effects of minor and severe conduct problems, relative to having no conduct problems in childhood, at the quartiles of the employment months distribution.

Concentrating on BCS70 men and Model 1 in Table 4 we see that men with minor conduct problems at the bottom quartile of the employment distribution (P25) spent 9.8 fewer months in employment compared with those without conduct problems. The effect halves to four months for men in the middle of the employment distribution (P50) and falls further to a statistically non-significant half-a-month at the 75th percentile of the employment months distribution. In comparison, those who had suffered severe conduct problems in childhood had 34.4, 20.9 and 5.9 fewer months in employment between age 17 and 42 respectively when compared to those with no conduct problems. The negative association between conduct problems and months in employment is greatest (smallest) among those who have the poorest (best) employment records in adulthood. These effects are of a similar magnitude as we condition on more variables (moving from Model 1 to Model 4). The wide range of family and individual characteristics including childhood cognition and examination results at age 16 had very little – if any – impact on the strong relationship between teenage conduct problems and the number of months men spend in employment over the 26 years between age 17 and 42. This pattern holds across the employment distribution.

Results are similar among men in the NCDS cohort (top panel of Table 4) although the effects of conduct problems on time in employment are weaker in the upper quartile of the employment distribution, no doubt because there was less variance in employment rates among those in the top quartile in the NCDS cohort. Otherwise, the magnitude of conduct problem effects is similar in the bottom half of the employment distribution to that observed for the BCS cohort, and results are similarly robust to the inclusion of additional controls.

The broad pattern of results is similar for women (Table 5): the effects of conduct problems rise with their severity; they are larger in the lower part of the employment distribution and are robust to the addition of controls. Results are similar for women across both birth cohorts, though the effects of severe conduct problems in the bottom

quartile of the employment distribution seem to have increased in size between the NCDS and BCS cohorts.

5.2.2: EET

The relationship between conduct problems and months spent in EET across the distribution for men is depicted in Table 6. The association between conduct problems in childhood and lost months in EET follows similar patterns to that for months in employment, but the effects tend to be larger. For instance, among the NCDS birth cohort, men at the bottom quartile of the EET distribution who had severe conduct problems in childhood spend 56 months less time in EET than those who had no conduct problems (compared to a 33-month differential in employment months). Even when one conditions on a wide range of individual and background family variables the differential remains 38 months, and it remains 38 months even when conditioning on educational attainment by age 16. The differential is roughly half the size for those men in NCDS at the median point in the EET distribution, but the effects remain large. Results are similar in the BCS cohort.

Tables 6 and 7 here

Turning to women, a more complex relationship emerges across cohorts. As Table 7 shows, compared to women in the 1958 cohort, conduct problems had more impact on time spent in EET for women in the 1970 cohort at the lower (P25) and middle (P50) of the distribution, and less impact for those at the upper end. Concentrating on Model 1, Table 7 shows that women in the 1958 cohort at the lower end of the distribution (P25) with minor or severe conduct problems spent 20.3 and 46.7 fewer months in EET respectively, relative to those with no conduct problems, while those in the middle (P50) spent 18.1 and 37.2 fewer months in EET, and those at the upper end (P75) 16.5 and 34.8 fewer months. For women in the 1970 cohort, we see that the relationship was similar for those with minor or severe conduct problems at the lower (26.4 and 65.5 fewer months in EET) and the middle (24.5 and 56.2 fewer months) of the distribution. But minor and severe conduct problems had far less impact on time in EET for those at the upper end of the EET distribution (reducing EET by 5.7 and 20.3 months respectively). These cohort differences at the upper end of the distribution could reflect

the longer time spent in education or training by women in the 1970 cohort (See Appendix A4).

Unlike for months spent in employment, family background and individual characteristics did more to attenuate the relationship between conduct problems and months spent in EET for men and women with minor and severe conduct problems across the distribution in both cohorts. However, the gaps remained sizable. Given the wide array of conditioning variables included in the full model – most notably cognition and examination results at age 16 - it is very unlikely that the inclusion of additional variables would remove the gaps and attribute the entire estimated effect of conduct problems on time spent in employment or EET to selection bias (Altonji et al. 2005; Oster, 2014).

5.2.3: When Do Gaps Start to Appear?

To see when the gaps started to appear, we used the life history data to generate an economic activity status for each of the 26 individual years between age 17 and 42. These identified whether cohort members had spent the majority of each 12-month period in employment or EET. In the case that an equal number of months were spent in and out of employment or EET, an employed or EET status was awarded. Figures 1 to 8 reveal a remarkably stable picture for both men and women in both cohorts. The gaps emerge early and persist over the years. For instance, Figure 1 shows the percentage of men in the NCDS in employment each year between ages 17 and 42 by teenage conduct status. Among those with no conduct problems in childhood employment rates rise by one-third to over 90% once they reach their mid-20s, and then plateau. Those with mild problems in childhood (1 or 2 behavioural problems) see a shallower rise in their employment rates that peak at around 90% when age 30. But among those who suffered severe behavioural problems employment rates tend to flat-line throughout, varying between about 75% and 85%: they see none of the improvement in employment rates seen by the other two groups in their late-teens and twenties.

If we turn to employment rates among men in BCS all three groups experience a rapid growth in employment rates in their late teens, after which point employment rates fan out. Those with no conduct problems in childhood experience continued growth in

employment rates until their late 20s, while those with mild problems in childhood follow a similar, shallower trajectory. Those with severe problems experience some improvement but the 10-percentage point gap in employment by age 27 between those with severe and those with no problems persists after that point all the way through to age 42.

Figures 3 and 4 present similar graphs for NCDS and BCS men respectively, but this time for EET rates. In NCDS, whereas EET rates flat-line among those with no and mild problems, the small gap at the outset compared with those with severe problems opens up quickly as EET rates fall for this group in their early 20s. Despite some recovery in their mid- to late-20s, there is further deterioration thereafter such that EET rates among those men with severe conduct problems in childhood fall almost 10-percentage points between age 17 and 42. The picture looks a little different in BCS with those with no problems and those with minor problems seeing gradual growth in their EET rates over their life-course, compared to them flat-lining among those with severe problems. This results in a 5-percentage point gap in EET rates at age 17 widening to 12 percentage points by age 42.

Turning to women, Figure 5 presents employment rates in NCDS for women by teenage conduct status. Employment rates are initially a little higher among those with severe conduct problems when compared to those with mild or no problems, but the situation is very quickly reversed once women entered their 20s. Employment rates plummeted to 50% by age 27 among those women with severe conduct problems in childhood – 15 percentage points below those who had had no problems in childhood. They recovered somewhat subsequently but there was still a 10-percentage point gap by age 42.

In BCS, what was only a small employment gap at age 20 between those with no conduct and those with severe conduct problems had opened up to a 20-percentage point employment gap by age 23 (Figure 6). The gap closed somewhat in their 30s but remained 13 percentage points by age 42.

Finally, turning to EET rates among women, we see a u-shaped pattern in the NCDS cohort between age 17 and 42, but it is much shallower for those with no conduct

problems in childhood (Figure 7). The gap in EET rates is greatest in their mid-20s but persists throughout. The u-shape is also apparent in EET rates among women in BCS who had experienced severe behavioural problems in childhood, but it is less apparent in other women (Figure 8). Again, the gap that opens up rapidly from late-teenhood never closes, although rates do converge a little once women enter their 30s.

Figures 1 to 8 here

6. Discussion and Conclusion

In this paper, we explore the extent to which those with identified conduct disorder problems prior to entering the labour market face cumulative disadvantage over twenty-six years from age 17 to age 42.

Using comparable data across two birth cohorts born 12 years apart we have shown that those identified with conduct problems spend considerably less time in employment and in EET than their counterparts without identified conduct problems. The gaps remain sizeable controlling for family background and individual characteristics: indeed, in many cases, the introduction of these controls does little to diminish the size of the gaps. Furthermore, the inclusion of educational attainment at age 16 plays little role, suggesting that the effects of cognitive problems in childhood do not operate through any adverse impact they may have in obtaining school qualifications.

Those with more severe behavioural problems in childhood face the biggest labour market penalties in adulthood. These tend to emerge early in the life-course and persist through to age 42, although there are some differences in the changing size of the penalties across gender, cohort and whether we are measuring employment or EET rates. There is no evidence that those with the most severe childhood conduct problems are catching up in labour market terms as they approach age 42.

Quantile regressions reveal that those with the poorest labour market credentials suffer most from their childhood conduct problems, and those with the strongest employment records suffer least.

The previous literature points to potentially important gender differences in the relationship between conduct problems in childhood and subsequent labour market experiences. We have shown that impacts on participation appear to be larger for women with conduct problems than for men, even if women make up a smaller proportion of those who are identified with teenage conduct problems. This may indicate that the challenges women face are more severe, or it may reflect on the ways in which the intersection of sex and behaviour is particularly penalised.

Youth mental health difficulties have increased substantially for current generations of youth, and may have been exacerbated by the COVID-19 pandemic (e.g. Banks and Xu, 2020). Our findings suggest that the long-term employment implications should be a matter of concern and research interest.

References

- Banks, J. and Xu, X. (2020). The Mental Health Effects of the First Two Months of Lockdown during the COVID-19 Pandemic in the UK. *Fiscal Studies*, vol. 41, no. 3, pp. 685–708.
- Borschmann, R., Becker, D., Coffey, C., et al. (2017). 20-year outcomes in adolescents who self-harm: a population-based cohort study. *Lancet Child Adolesc Health*, 1, 195–202.
- Borschmann, R. and Kinner, S. (2019). Responding to the rising prevalence of self-harm. *The Lancet Psychiatry*, 6(7), 548-549. [http://dx.doi.org/10.1016/S2215-0366\(19\)30210-X](http://dx.doi.org/10.1016/S2215-0366(19)30210-X)
- 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*, Vol 36 (4): 836–854, <https://doi.org/10.1093/oxrep/graa046>
- Caspi, A., Entner Wright, B.R., Moffitt, T.E. and Silva, P.A. (1998). Early failure in the labour market: childhood and adolescent predictors of unemployment in the transition to adulthood. *Am Socio Rev* 63: 424-451.
- Clark, A. and Lepinteur, A. (2019). The causes and consequences of early-adult unemployment: Evidence from cohort data. *Journal of Economic Behavior and Organization*, 166, 107–124. <https://doi.org/10.1016/j.jebo.2019.08.020>
- Collishaw, S., Maughan, B., Goodman, R. et al. (2004) Time trend in adolescent mental health. *Journal of Child Psychology and Psychiatry*. 45, 1350-62.
- Colman, I., Murray, J., Abbott, R., Maughan, B., Kuh, D., Croudace, T. and Jones P.B. (2009). Outcomes of conduct problems in adolescence: 40 year follow up of national cohort. *BMJ* 338:a2981 doi:10.1136/bmj.a2981
- Corker, E., Hamilton, S., Henderson, C., Weeks, C., Pinfold, V., Rose, D., Williams, P., Flach, C., Gill, V., Lewis-Holmes, E. and Thornicroft, G. (2013). Experiences of discrimination among people using mental health services in England 2008–2011. *The British Journal of Psychiatry*, 202, s58–s63. doi: 10.1192/bjp.bp.112.112912
- Egan, M., Daly, M. and Delaney, L. (2015). Childhood psychological distress and youth unemployment: Evidence from two British Cohort Studies. *Social Science and Medicine*, 124, 11-17.
- Elander, J., and Rutter, M. (1996). Use and development of the Rutter Parents' and Teachers' Scales. *International Journal of Methods in Psychiatric Research*, 6, 63-78.
- Elliott, J., and Shepherd, P. (2006). Cohort Profile: 1970 British birth cohort (BCS70). *International Journal of Epidemiology*, 35(4), 836-43.
- Farrington, D. P. (1995). The development of offending and anti-social behaviour from childhood: key findings from the Cambridge study in delinquent development. *Journal of Child Psychology and Psychiatry*, 36, 929–64.
- Feinstein, L. (2000). *The relative economic importance of academic psychological and behavioural attributes developed in childhood*. Centre for Economic Performance (LSE) Discussion paper 443.

- Goodman, A., Joyce, R. and Smith, J. P. (2011). The long shadow cast by childhood physical and mental problems on adult life. *Proceedings of the National Academy of Sciences of the United States of America*, 108 (15), 6032-7.
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A Research Note. *Journal of Child Psychology and Psychiatry*, 38(5), 581-586.
- Goodman, R. (2001). Psychometric properties of the Strengths and Difficulties Questionnaire (SDQ). *Journal of the American Academy of Child and Adolescent Psychiatry*, 40, 1337- 1345.
- Green, H., McGinnity, A.N., Meltzer, H., Ford, T. and Goodman, R. (2005). *Mental Health of Children and Young People in Great Britain, 2004*. Report No.: 1403986371. London: Office for National Statistics.
- Hammerton, G., Murray, J., Maughan, B. et al. (2019). Childhood Behavioural Problems and Adverse Outcomes in Early Adulthood: a Comparison of Brazilian and British Birth Cohorts. *Journal of Development Life Course Criminology* 5, 517–535.
- Healey, A., Knapp, M. and Farrington, D. P. (2004). Adult labour market implications of antisocial behaviour in childhood and adolescence: findings from a UK longitudinal study, *Applied Economics*, 36:2, 93-105,
<https://doi.org/10.1080/0003684042000174001>
- Henderson C, Thornicroft G. (2009). Stigma and discrimination in mental illness: Time to Change. *Lancet*, 373: 1928–30.
- Kessler, R.C., Barker, P.R., Colpe, L. J., et al. Screening for Serious Mental Illness in the General Population. *Arch Gen Psychiatry*. 2003;60(2):184–189.
doi:10.1001/archpsyc.60.2.184
- Knapp, M., King, D., Healey, A. and Thomas, C. (2011). Economic outcomes in adulthood and their associations with antisocial conduct, attention deficit and anxiety problems in childhood. *Journal of mental health policy and economics*, 14 (3): 137-147.
- Kokko, K. and Pulkkinen, L. (2000). Aggression in childhood and long-term unemployment in adulthood: a cycle of maladaptation and some protective factors. *Developmental Psychology*. 36, 463-72. <https://doi.org/10.1037//0012-1649.36.4.463>.
- Little, R. and Rubin, D. (2014). *Statistical analysis with missing data*: 2nd edition. John Wiley and Sons.
- Mehta, N., Kassam, A., Leese, M., Butler, G. and Thornicroft, G. (2009). Public attitudes towards people with mental illness in England and Scotland, 1994–2003. *British Journal of Psychiatry*, 194: 278–84
- Mostafa, T., Narayanan, M., Pongiglione, B., Dodgeon, B., Goodman, A., Silverwood, R., and Ploubidis, G. (2020). *Improving the plausibility of the missing at random assumption in the 1958 British birth cohort: A pragmatic data driven approach*. London: UCL Centre for Longitudinal Studies Working Paper Series. <https://cls.ucl.ac.uk/wp-content/uploads/2020/04/CLS-working-paper-2020-6-Improving-the-plausibility-of-the-missing-at-random-assumption-in-the-1958-British-birth-cohort.pdf>

- Muthén, L. K. and Muthén, B. O. (1998-2017). *Mplus User's Guide*. Eighth Edition. Los Angeles, CA: Muthén and Muthén
- NHS Digital. (2018). *Mental Health of Children and Young People in England, 2017: Summary of Key Findings*. Government Statistical Service.
- Palloni, A. (2006). Reproducing inequalities: Luck, wallets and the enduring effects of childhood health. *Demography*, 43, 587-615. <https://doi.org/10.1353/dem.2006.0036>
- Parks J, Svendsen D, Singer P, Fonti ME, and Mauer B (2006). *Morbidity and Mortality in People with Serious Mental Illness (Thirteenth in a Series of Technical Reports)*. Alexandria, Virginia: National Association of State Mental health Program Directors (NASMHPD) Medical Directors Council.
- Patalay, P. and Gage, S. H. (2019). Changes in millennial adolescent mental health and health-related behaviours over 10 years: a population cohort comparison study. *International Journal of Epidemiology*, <https://doi.org/10.1093/ije/dyz006>
- Pitchforth, J., Fahy, K., Ford, T., Wolpert, M., Viner, R. M. and Hargreaves, D. S. (2018). Mental health and well-being trends among children and young people in the UK, 1995–2014: analysis of repeated cross-sectional national health surveys. *Psychological Medicine*; Sept 11 (Epub ahead of print).
- Power, C. and Elliott, J. (2006) Cohort profile: 1958 British birth cohort (National Child Development Study). *International Journal of Epidemiology*, 35(1): 34–41.
- Richards, M., Abbott, R., Collis, G., Hackett, P., Hotopf, M., Kuh, D., Jpnnes, P., Maughan, B., and Parsonage, M. (2009). *Childhood mental health and life changes in post-war Britain – insights from three national birth cohort studies*. A report for the Sainsbury Centre for Mental Health.
- Rutter, M., Tizard, J. and Whitmore, K. (1970). *Education, health and behaviour*. London: Longman.
- Sayal K, Washbrook E, Propper C. (2015). Childhood Behavior Problems and Academic Outcomes in Adolescence: Longitudinal Population-Based Study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 54(5):360–8. <https://doi.org/10.1016/j.jaac.2015.02.007>
- Schafer, J.L. 1997. *Analysis of Incomplete Multivariate Data*. London: Chapman and Hall.
- Silverwood, R., Narayanan, M., Dodgeon, B., and Ploubidis, G. B. (2020). *Handling missing data in the National Child Development Study: User guide*. London: UCL Centre for Longitudinal Studies.
- Smith, J. P. and Smith, G. C. (2010). Long-term economic costs of psychological problems during childhood. *Social Science and Medicine*, 71(1): 110-15. <https://doi.org/10.1016/j.socscimed.2010.02.046>
- StataCorp. (2019). *Stata Statistical Software: Release 16*. College Station, TX: StataCorp LLC.
- University of London, Institute of Education, Centre for Longitudinal Studies, Chamberlain, R. (2013). 1970 British Cohort Study: Birth and 22-Month Subsample, 1970-1972. [data collection]. 3rd Edition. UK Data Service. SN: 2666, <http://doi.org/10.5255/UKDA-SN-2666-2>

University of London, Institute of Education, Centre for Longitudinal Studies. (2016a). 1970 British Cohort Study: Five-Year Follow-Up, 1975. [data collection]. 5th Edition. UK Data Service. SN: 2699, <http://doi.org/10.5255/UKDA-SN-2699-4>

University of London, Institute of Education, Centre for Longitudinal Studies. (2016b). 1970 British Cohort Study: Ten-Year Follow-Up, 1980. [data collection]. 6th Edition. UK Data Service. SN: 3723, <http://doi.org/10.5255/UKDA-SN-3723-7>

University of London, Institute of Education, Centre for Longitudinal Studies. (2020a). National Child Development Study: Childhood Data from Birth to Age 16, Sweeps 0-3, 1958-1974. [data collection]. 3rd Edition. National Children's Bureau, National Birthday Trust Fund, [original data producer(s)]. National Children's Bureau. SN: 5565, <http://doi.org/10.5255/UKDA-SN-5565-2>

University of London, Institute of Education, Centre for Longitudinal Studies. (2020b). 1970 British Cohort Study: Sixteen-Year Follow-Up Dietary Diaries, 1986. [data collection]. UK Data Service. SN: 8618, <http://doi.org/10.5255/UKDA-SN-8618-1>

University of London, Institute of Education, Centre for Longitudinal Studies. (2020c). National Child Development Study: Activity Histories, 1974-2013. [data collection]. 2nd Edition. UK Data Service. SN: 6942, <http://doi.org/10.5255/UKDA-SN-6942-3>

University College London, UCL Institute of Education, Centre for Longitudinal Studies. (2021). 1970 British Cohort Study: Activity Histories, 1986-2016: Secure Access. [data collection]. UK Data Service. SN: 8787, <http://doi.org/10.5255/UKDA-SN-8787-1>

White, I.R., Royston, P., and Wood, A.M. (2011). Multiple imputation using chained equations: Issues and guidance for practice. *Stat Med*, 30(4): 377-399. <https://doi.org/10.1002/sim.4067>

Table 1 Specific wording of Conduct disorder questions in the Rutter scales completed by 1958 and 1970 cohort members parent/guardian at child age 16

Specific wording of question	NCDS	BCS70
Often destroys own or others' belongings.		✓
Often destroys own or others' property.	✓	
Frequently fights with others.		✓
Frequently fights or is extremely quarrelsome with other children.	✓	
Is often disobedient.	✓	✓
Often tells lies.	✓	✓
Bullies other children.	✓	
Bullies others.		✓

Table 2 Distribution across conduct behaviour groups by cohort and sex

	Men		Women	
	NCDS	BCS70	NCDS	BCS70
No problems [0]	62.0	55.9	65.8	60.8
Minor problems [1-2]	31.1	33.4	28.5	30.9
Severe problems [3+]	6.9	10.7	5.7	8.3
<i>Unweighted N (100%)</i>	<i>8315</i>	<i>8237</i>	<i>7923</i>	<i>7891</i>

Table 3 Mean number of months spent in employment and EET between age 17-42 by cohort and sex

	Months employed 17-42		Months EET 17-42	
	NCDS	BCS70	NCDS	BCS70
	Mean (se)	Mean (se)	Mean (se)	Mean (se)
Men	271 (.70)	259 (2.03)	283 (.65)	278 (2.07)
Women	218 (.96)	224 (1.88)	232 (.96)	245 (1.92)

Table 4 Men: months spent in employment between 17-42 by conduct score

NCDS	Ref Cat: 0	Model 1	Model 2	Model 3	Model 4
P25	1-2 score	-6.4 (2.75)	-7.8 (2.91)	-8.6 (3.00)	-9.2 (3.13)
	3+ score	-33.2 (5.87)	-35.1 (5.64)	-35.7 (5.88)	-36.0 (6.28)
P50	1-2 score	-2.5 (2.04)	-4.3 (1.95)	-5.0 (1.89)	-5.3 (1.82)
	3+ score	-14.0 (3.76)	-15.4 (3.68)	-17.1 (3.75)	-17.8 (3.60)
P75	1-2 score	No variability	No variability	No variability	No variability
	3+ score	-1.8 (1.24)	-1.4 (1.32)	-1.4 (1.32)	-1.4 (1.42)
<i>N (100%)</i>		8315	8315	8315	8315
BCS70	Ref Cat: 0	Model 1	Model 2	Model 3	Model 4
P25	1-2 score	-9.8 (3.40)	-9.8 (3.42)	-7.5 (2.99)	-9.3 (3.25)
	3+ score	-34.4 (6.75)	-31.7 (6.35)	-29.3 (5.81)	-31.4 (6.42)
P50	1-2 score	-4.0 (2.59)	-3.7 (2.27)	-3.5 (2.15)	-4.9 (2.07)
	3+ score	-20.9 (5.22)	-18.9 (5.01)	-18.6 (4.74)	-20.1 (4.83)
P75	1-2 score	-0.5 (0.77)	-0.8 (0.93)	-0.8 (0.90)	-0.8 (0.96)
	3+ score	-5.9 (2.84)	-5.6 (2.36)	-5.5 (2.29)	-5.4 (2.29)
<i>N (100%)</i>		7923	7923	7923	7923

Note: Model 1: Conduct problems 16; Model 2: Model 1 + Family characteristics; Model 3: Model 2 + Individual characteristics (inc. cognition age 10/11); Model 4: Model 3 + exam passes 16

Table 5 Women: months spent in employment between 17-42 by conduct score

NCDS	Ref Cat: 0	Model 1	Model 2	Model 3	Model 4
P25	1-2 score	-13.8 (3.49)	-13.2 (3.94)	-10.5 (3.97)	-10.1 (3.98)
	3+ score	-38.3 (7.11)	-37.4 (7.57)	-31.8 (7.53)	-30.5 (7.42)
P50	1-2 score	-10.7(2.95)	-9.9 (3.02)	-7.9(2.93)	-7.7 (2.88)
	3+ score	-28.1(6.32)	-27.5(6.40)	-24.3 (6.06)	-23.4 (5.81)
P75	1-2 score	-6.4 (2.95)	-6.3 (2.95)	-5.3 (3.09)	-5.5 (2.97)
	3+ score	-17.9 (6.15)	-19.1 (6.02)	-17.1 (5.92)	-17.3 (6.14)
		8237	8237	8237	8237
BCS70	Ref Cat: 0	Model 1	Model 2	Model 3	Model 4
P25	1-2 score	-18.8 (3.59)	-12.6(3.86)	-10.7 (3.76)	-10.8 (3.77)
	3+ score	-54.5 (6.43)	-44.1 (6.44)	-38.3 (7.06)	-38.2 (7.43)
P50	1-2 score	-10.9 (3.16)	-9.1 (3.35)	-8.0 (3.16)	-8.3 (3.03)
	3+ score	-35.5 (6.04)	-30.7 (6.57)	-27.4 (6.23)	-28.7(6.38)
P75	1-2 score	-5.9 (3.12)	-5.3 (2.84)	-4.6 (2.72)	-5.2 (2.73)
	3+ score	-19.2(5.08)	-18.3 (5.37)	-17.2 (5.82)	-17.6 (5.70)
<i>N(100%)=</i>		7891	7891	7891	7891

Note: Model 1: Conduct problems 16; Model 2: Model 1 + Family characteristics; Model 3: Model 2 + Individual characteristics (inc. cognition age 10/11); Model 4: Model 3 + exam passes 16

Table 6 Men: months spent in EET between 17-42 by conduct score

NCDS	Ref Cat: 0	Model 1	Model 2	Model 3	Model 4
P25	1-2 score	-21.1 (3.34)	-17.2 (2.97)	-12.1 (2.97)	-11.8 (2.83)
	3+ score	-55.9 (6.68)	-47.6 (5.68)	-38.4 (6.28)	-37.9 (6.63)
P50	1-2 score	-7.2 (1.35)	-4.9 (1.45)	-3.0 (1.36)	-2.6 (1.33)
	3+ score	-26.2 (2.52)	-22.6 (2.96)	-19.4 (3.19)	-18.9 (2.88)
P75	1-2 score	No variability	No variability	No variability	No variability
	3+ score	No variability	No variability	No variability	No variability
<i>N (100%)</i>		8315	8315	8315	8315
BCS70	Ref Cat: 0	Model 1	Model 2	Model 3	Model 4
P25	1-2 score	-24.9 (3.60)	-17.0 (3.24)	-12.3 (2.85)	-12.4 (2.90)
	3+ score	-59.2 (7.22)	-45.5 (6.36)	-36.3 (6.13)	-36.2 (6.11)
P50	1-2 score	-6.8 (2.11)	-4.0 (1.34)	-3.3 (1.33)	-3.4 (1.32)
	3+ score	-28.3 (5.18)	-23.2 (4.39)	-20.5 (4.41)	-20.6 (4.54)
P75	1-2 score	-0.6 (0.55)	-0.6 (0.37)	-0.4 (0.28)	-0.4 (0.29)
	3+ score	-2.9 (0.65)	-2.7 (0.69)	-2.4 (0.73)	-2.4 (0.71)
<i>N (100%)</i>		7923	7923	7923	7923

Note: Model 1: Conduct problems 16; Model 2: Model 1 + Family characteristics; Model 3: Model 2 + Individual characteristics (inc. cognition age 10/11); Model 4: Model 3 + exam passes 16

Table 7 Women: months spent in EET between 17-42 by conduct score

NCDS	Ref Cat: 0	Model 1	Model 2	Model 3	Model 4
P25	1-2 score	-20.3 (3.31)	-16.3 (3.54)	-11.9 (3.67)	-10.4 (3.74)
	3+ score	-46.7(7.46)	-37.8 (8.21)	-31.0 (7.24)	-29.4 (7.09)
P50	1-2 score	-18.1 (2.95)	-14.6 (2.77)	-11.3 (2.97)	-10.1 (2.88)
	3+ score	-37.2 (6.45)	-31.2 (5.80)	-24.7(5.86)	-22.4 (5.64)
P75	1-2 score	-16.5 (3.25)	-13.0 (3.20)	-6.5 (2.70)	-6.2 (2.81)
	3+ score	-34.8 (6.02)	-29.1 (5.90)	-21.3 (5.95)	-19.3 (6.29)
<i>N(100%)=</i>		8237	8237	8237	8237
BCS	Ref Cat: 0	Model 1	Model 2	Model 3	Model 4
P25	1-2 score	-26.4 (4.01)	-18.7 (3.98)	-15.3 (4.11)	-14.6 (4.01)
	3+ score	-65.5 (7.29)	-50.5 (7.01)	-42.9 (6.97)	-41.3 (6.93)
P50	1-2 score	-24.5 (4.55)	-15.5 (3.87)	-11.1 (3.12)	-10.3 (3.32)
	3+ score	-56.2 (6.51)	-41.1 (6.76)	-33.2 (6.09)	-32.6 (6.24)
P75	1-2 score	-5.7 (1.99)	-3.5 (1.31)	-2.9 (1.70)	-3.0 (1.68)
	3+ score	-20.3 (5.38)	-16.1 (4.38)	-14.1 (4.41)	-13.9 (4.41)
<i>N(100%)=</i>		7891	7891	7891	7891

Note: Model 1: Conduct problems 16; Model 2: Model 1 + Family characteristics; Model 3: Model 2 + Individual characteristics (inc. cognition age 10/11); Model 4: Model 3 + exam passes 16

Figure 1 NCDS Men: % employed in each year age 17-42 (1975-2000) by teenage conduct problems

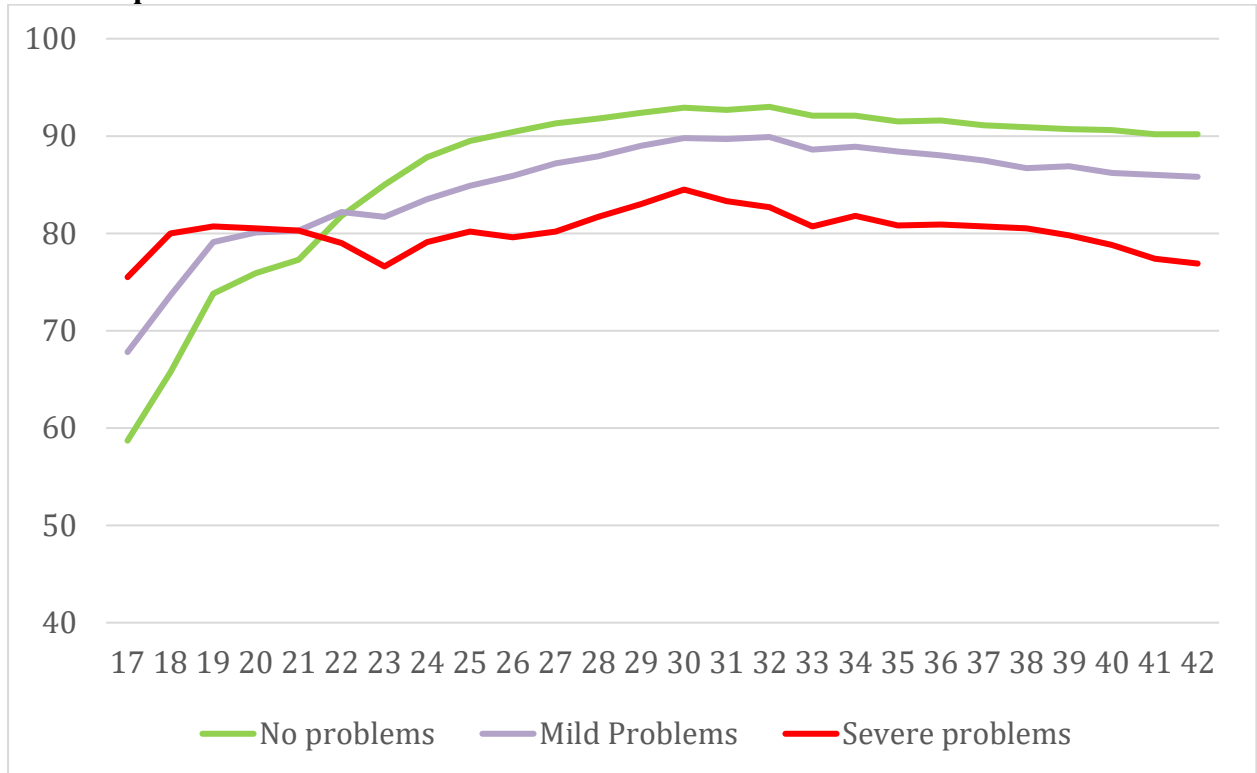


Figure 2 BCS70 Men: % employed in each year age 17-42 (1987-2012) by teenage conduct problems

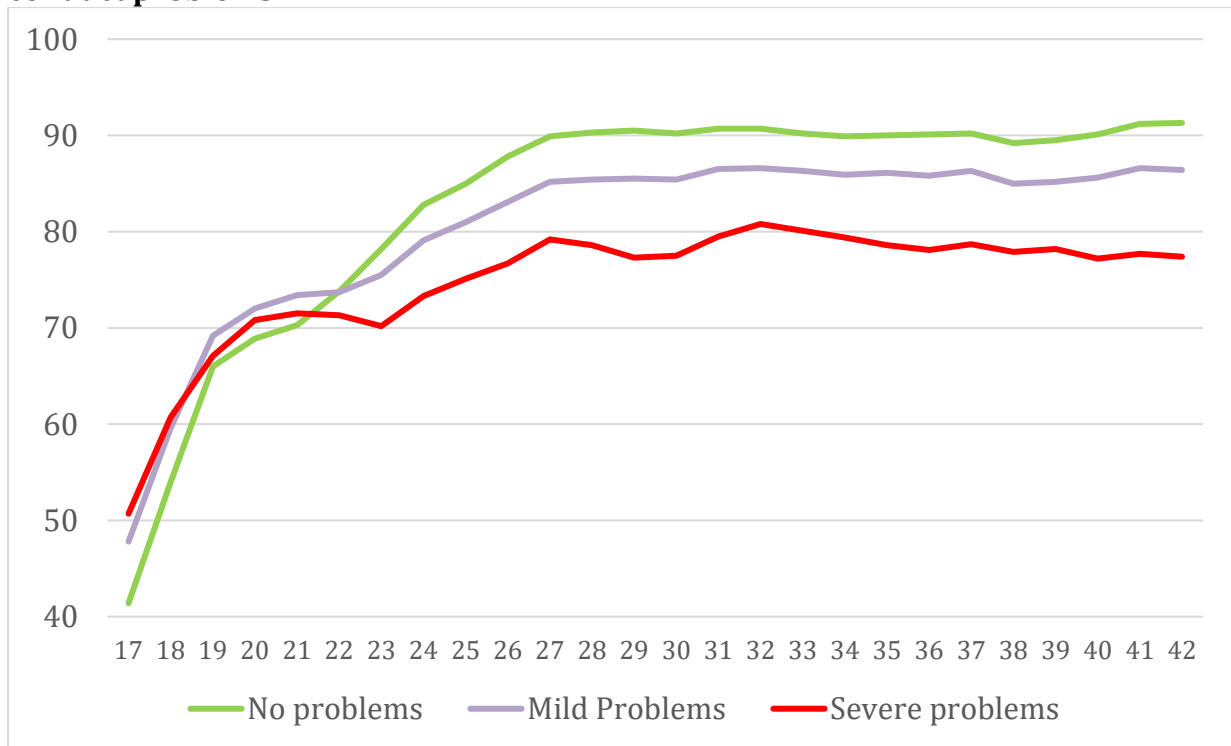


Figure 3 NCDS Men: % in EET in each year age 17-42 (1975-2000) by teenage conduct problems

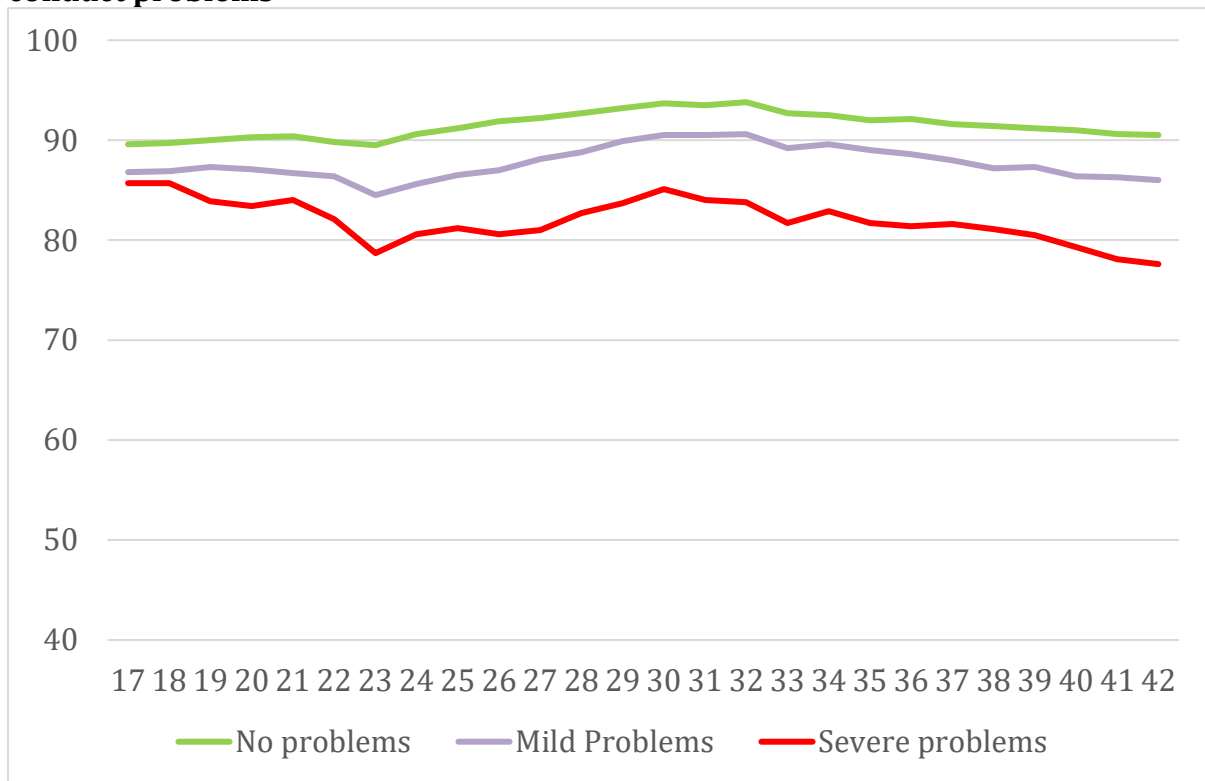


Figure 4 BCS70 Men: % in EET in each year age 17-42 (1987-2012) by teenage conduct problems

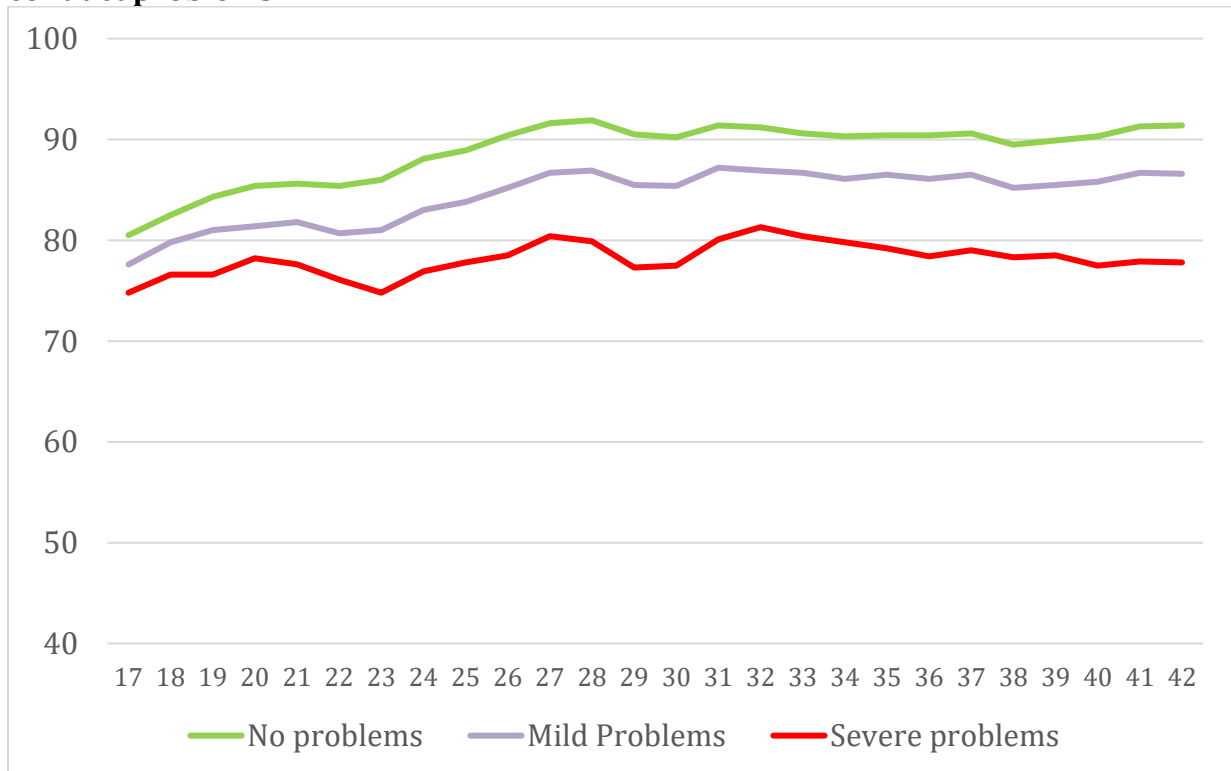


Figure 5 NCDS Women: % employed in each year age 17-42 (1975-2000) by teenage conduct problems

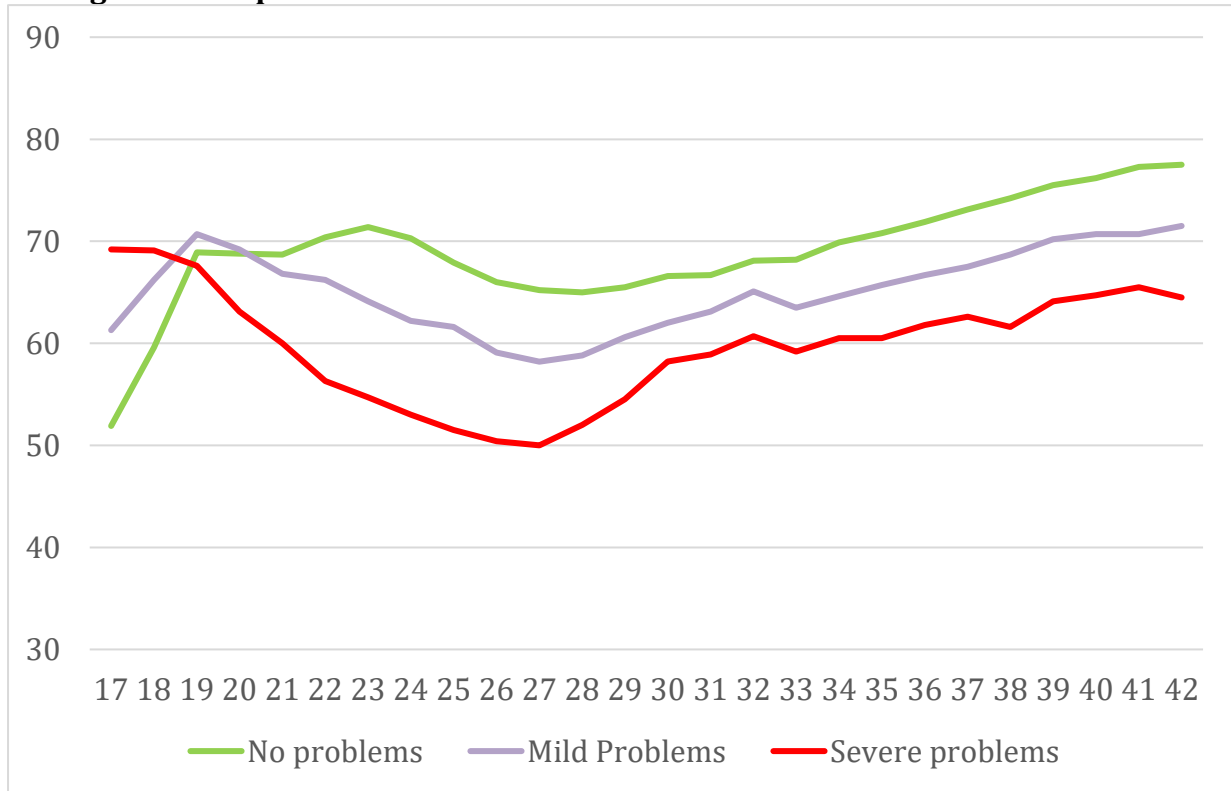


Figure 6 BCS70 Women: % employed in each year age 17-42 (1987-2012) by teenage conduct problems

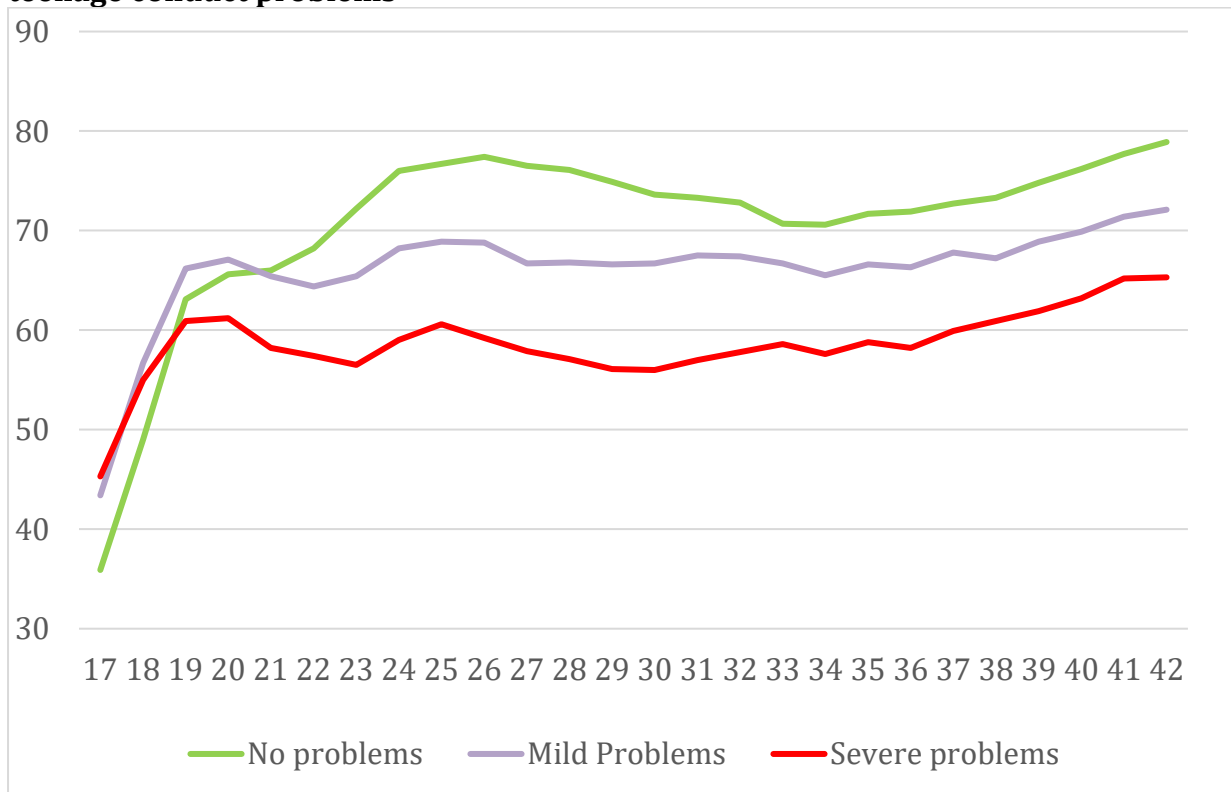


Figure 7 NCDS Women: % in EET in each year age 17-42 (1975-2000) by teenage conduct problems

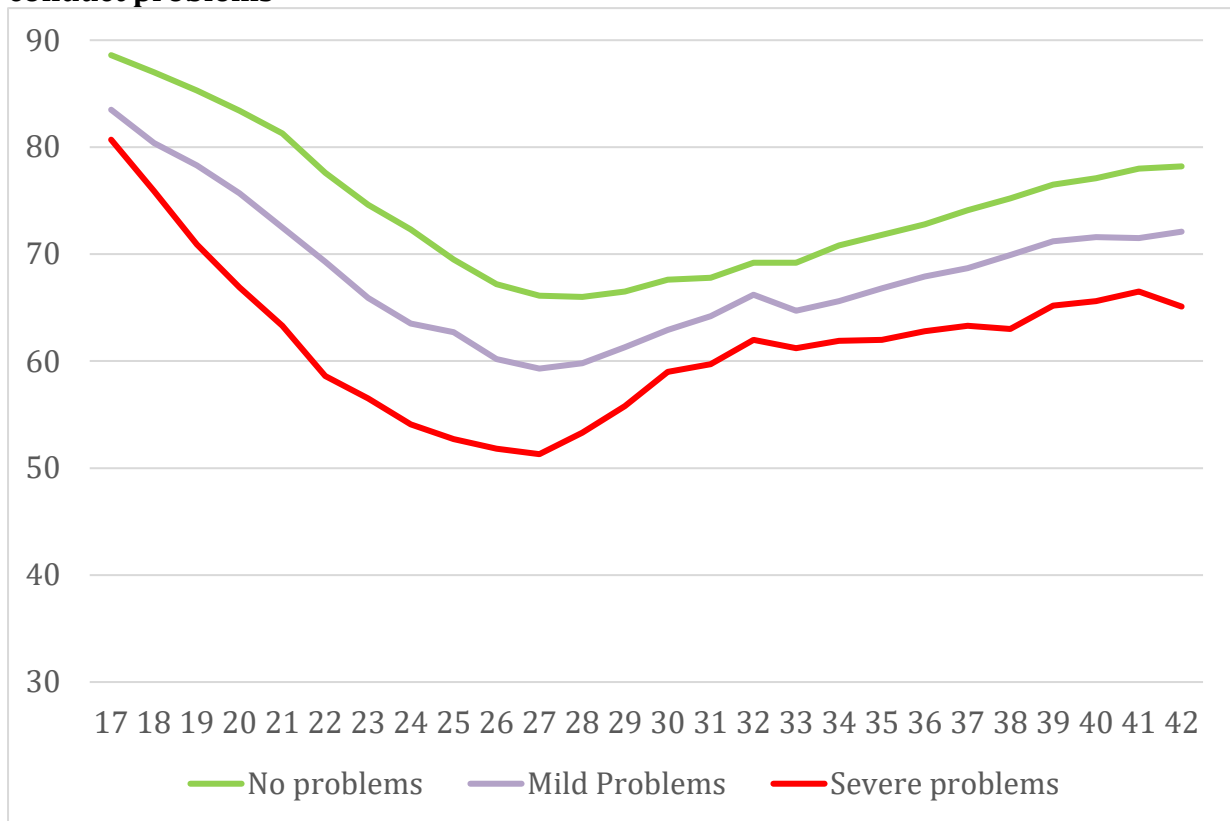


Figure 8 BCS70 Women: % in EET in each year age 17-42 (1987-2012) by teenage conduct problems

