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**Parental socioeconomic resources and adverse childhood experiences as predictors of Not in Education, Employment, or Training (NEET): a Finnish register-based longitudinal study**

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# **Parental socioeconomic resources and adverse childhood experiences as predictors of Not in Education, Employment, or Training (NEET): a Finnish register-based longitudinal study**

Socioeconomic disadvantage in childhood is common among youth not in education, employment or training (NEETs). However, the evidence on other adverse childhood experiences as determinants of NEET remains scarce. We use Finnish longitudinal register data on a 20% random sample of households with 0–14-year-old children in 2000 to assess the childhood determinants of NEET. For an analytical sample of 99,137 children born 1986–1993, family socioeconomic resources, parental psychiatric disorders and substance abuse, parental death, living in a single-parent household and out-of-home placement under age 13 were used to predict NEET at the age of 18. We show that family socioeconomic disadvantage is strongly associated with NEET (e.g. odds ratio for parental basic education 5.33, 95% confidence interval 4.77, 5.95), whereas associations between adverse childhood experiences and NEET are more moderate (e.g. odds ratio for parent hospitalised for psychiatric disorder 1.86, 95% confidence interval 1.63, 2.12) and largely explained by socioeconomic factors. These associations were mostly similar by gender. The results suggest that parental socioeconomic resources are more important than adverse childhood experiences for the educational and employment transitions of young adults. Thus, supportive social policy for socioeconomically disadvantaged families may smooth these transitions.

Keywords: NEET; family background; parental socioeconomic resources; childhood adversities

## **Introduction**

There has been widespread concern for the wellbeing of young adults outside education and employment in the European Union, especially after the economic crisis in the late 2000s (Eurofound 2012). These youth, often referred to by the acronym NEET (Not in education, employment or training), have been repeatedly shown to have higher levels of wellbeing deficiencies than their peers. The experience of years spent outside of education and employment has been associated with lower future educational

attainment and income (OECD 2016; Eurofound 2012; Vanttaja and Järvinen 2006), problematic alcohol use (Paljärvi et al. 2015) and higher rates of psychiatric and somatic morbidity (O’Dea et al. 2014; OECD 2016). NEETs have also been shown to have higher levels of dissatisfaction with life (Bynner and Parsons 2002), and they tend to have lower levels of trust than their peers (OECD 2016). In addition, the economic costs caused by youth unemployment and the increased use of social and health services among NEET youth are a concern to policymakers (Eurofound 2012; OECD 2016).

Achieving educational qualifications and successful starts to working careers during the transition to adulthood are crucial determinants for later socioeconomic attainment (Bäckman and Nilsson 2011). However, opportunities for education and employment among youth are not equal: it is well established that youth transitions are dependent on the social background of individuals (Elder, Johnson, and Crosnoe 2003; Shanahan 2000) and that socioeconomic disadvantage and adverse experiences in childhood have long-term consequences on individual lives (Bäckman and Nilsson 2011; Vauhkonen et al. 2017). Accordingly, it is known that parental socioeconomic disadvantage (Duckworth and Schoon 2012; Dorsett and Lucchino 2014; Yates et al. 2011), parental disinterestedness towards education (Bynner and Parsons 2002) and poor parenting styles (Alfieri et al. 2015) are related to a higher risk of becoming NEET.

Most of the previous studies on the topic have focused on socioeconomic characteristics. How other adverse childhood experiences, such as parental psychiatric disorders and out-of-home placements, are related to the risk of NEET has not been studied extensively. Furthermore, most studies are based on cross-sectional data or longitudinal survey data that may suffer from significant loss to follow-up, retrospective self-report bias, or underrepresentation of vulnerable parts of the population. In this

study, we use administrative register data free of these limitations. The data also allows for accurate identification of parents and a wide range of their information on socioeconomic resources and health as well as family characteristics.

This study contributes to the existing literature by covering both parental socioeconomic resources and adverse childhood experiences, including parental psychiatric disorders and substance abuse, parental death, out-of-home placements and living in single-parent households. Our aim is to assess a broad range of concurrent childhood determinants of NEET status in the context of a universal welfare state, where education is free and transitions to secondary education are strongly encouraged. The chosen indicators tap into various early life course experiences, embedded in the social context of the family background. We follow a cohort of nearly 100,000 young individuals from birth to the age of 18, an age at which crucial educational transitions are in progress.

## **Background**

### ***NEET***

The categorisation of young adults as NEET is rooted in reforms of unemployment benefits in 1980s United Kingdom (Furlong 2006). The concept has since spread widely and it has been adopted by international organisations such as the EU (Eurostat 2018b) and the OECD (2016, 2017), as well as by researchers in various countries (Shinozaki 2012; Tamesberger and Bacher 2014; Vancea and Utzet 2018). The increased use of the concept is related to the inability of youth unemployment rate to fully illustrate the varied life situations of the youth population (Eurofound 2012).

Indeed, NEET has often been discussed in the context of the transformations and individualisation of school-to-work transitions (Dorsett and Lucchino 2014; Thompson

2011). During the phase of life after compulsory schooling, 'emerging adulthood', choices between wide range of options are made by experimenting and finding the suitable solutions (Arnett 2000). Therefore, short periods of NEET are not exceptional and generalising all of these youth under one category might be misleading (Furlong 2006; Maguire 2015; Serracant 2014; Thompson 2011; Yates and Payne 2006). Despite this well-justified critique, part of the NEET population is highly vulnerable in terms of their current and future wellbeing (Serracant 2014). For example, NEET youth from disadvantaged backgrounds are often those involuntarily disengaged from education and the labour market, for whom the NEET experience is not a choice but more likely related to unequal opportunities (Eurofound 2012).

### ***Childhood determinants of NEET***

In life course theory, individual lives are perceived as a series of distinct life phases and gradual transitions, forming an individual trajectory embedded in a larger historical and social context (Elder, Johnson, and Crosnoe 2003). Individuals are considered to construct their own trajectories as competent agents and to choose between different options during the phases, but these options are conditioned by social, structural and historical factors (Elder, Johnson, and Crosnoe 2003). However, due to different starting points produced by family backgrounds, individual attributes and structural constraints, the options between which to choose are not equally distributed (Bynner 2005; Schoon 2007; Thompson 2011).

### ***Socioeconomic factors***

Previous research has shown that low parental education, unemployment and economic adversity increase the risk of NEET (Duckworth and Schoon 2012; Yates et al. 2011; Schoon 2014), and low parental education has also been linked with fractured

transitions (Dorsett and Lucchino 2014). Furthermore, it is well-known that education, occupational class and income have an intergenerational gradient: parental socioeconomic status is partially transmitted to the next generation (Breen et al. 2010; Erola 2009; Jæger and Holm 2007; Sirniö, Martikainen, and Kauppinen 2013). Studies also show that receiving social assistance is more common among children whose parents have been recipients themselves (Kauppinen et al. 2014; Moisio and Kauppinen 2011; Vauhkonen et al. 2017), and that family economic deprivation is associated with lower educational attainment (Kallio, Kauppinen, and Erola 2016). In addition, unemployment and dropping out of school have been shown to be transmitted across generations (Vauhkonen et al. 2017). Even though these studies do not use NEET as an outcome, they do touch on the same topic, since the problematic transition to education and employment predicts lower future socioeconomic attainment (Eurofound 2012; Vanttaja and Järvinen 2006).

#### *Adverse childhood experiences*

Increasing number of epidemiological studies have examined adverse childhood experiences and their association with different health outcomes in the last decades (see. e.g. Björkenstam et al. 2016; Flaherty et al. 2013; Lanier et al. 2018). Originally, the term was used to refer to experiences of abuse, neglect, parental substance use, witnessing domestic violence and incarceration in family (Felitti et al. 1998) and later on also to other experiences, such as parental separation and death (Taylor-Robinson, Straatmann, and Whitehead 2018). Overall, the results show that adverse childhood experiences increase the risk of many health and behavioural outcomes, such as mental disorders (Björkenstam et al. 2016), substance abuse (Dube et al. 2003), and self-harm (Pitkänen et al. 2019) later in life.

There is scarce, but growing evidence that adverse childhood experiences are also associated with socioeconomic outcomes (Metzler et al. 2017). For instance, parental mental health and substance abuse disorders (Berg et al. 2016; Veldman, Bültmann, et al. 2015), dissolution of parental union (Amato and Anthony 2014), experiencing the death of a parent (Berg et al. 2014; Prix and Erola 2017), and out-of-home placements (O'Higgins, Sebba, and Luke 2015) have all been linked with outcomes such as poor school performance and future socioeconomic attainment. Adverse childhood experiences in the context of NEET are less studied but there is evidence that living with a single parent (Duckworth & Schoon 2012), childhood trauma (Lewis et al. 2019) and childhood psychological distress (Egan, Daly, and Delaney 2015) increase the risk of NEET, which indicates that diverse adverse childhood experiences are likely to be associated with NEET status.

#### *Gender differences in the determinants of NEET*

The impact of family background on socioeconomic attainment has been shown to be modified by gender; possibly due to gender-segregated labour markets and different social consequences of having children (Sirniö, Martikainen, and Kauppinen 2016) or gender roles (Kleinjans 2010). There is also some evidence of gender differences in the association between adverse childhood experiences and socioeconomic attainment. It has been argued that among boys, adverse experiences are increase the risk of externalising behaviour, which has more negative later outcomes in terms of education and employment than internalising behaviour, a reaction more common among girls (Veldman, Bültmann, et al. 2015). In the NEET context, there is little evidence on the topic, but there are indications that household poverty (Bynner & Parsons 2002) and intrusive parenting (Alfieri et al. 2015) are more detrimental for girls, and living in a single-parent household for boys (Schoon 2014).

In this study, NEET is conceptualised as problematic transition to education and employment, which might be driven by different levels of parental socioeconomic resources and individual factors shaped during processes of socialisation and child development. We hypothesise that both parental socioeconomic resources and adverse childhood experiences will increase the likelihood of being NEET and expect to find indications of gender differences in these associations.

### ***Data and methods***

This study used administrative register data on a 20% random sample of all households with at least one 0–14-year-old child in 2000 and a corresponding sample of children living outside of households (Statistics Finland permit number TK-53-525-11). The data includes all the household members as well as biological parents not co-residing with their children. The follow-up time of the data is 1987–2012. Socioeconomic and demographic information has been gathered by Statistics Finland, and health-related information by the National Institute for Health and Welfare (hospital discharge records) and Social Insurance Institution (purchases of prescription medication). Child welfare records are from the National Institute for Health and Welfare. Linkage between these individual-level records was done using personal identity numbers assigned to all residents of Finland.

Birth cohorts 1986–1993 (n=103,345) were included in this study. The individuals who either emigrated or died between ages 0–12 (n=3478) were excluded, as were those not living in Finland at the ages of 18 and 19 (n=663). In addition, those for whom we had no information on either of their parents (n=27) were excluded, as were those outside of households (e.g., in institutional care) for the entire time between ages 0–12 (n=40). The final size of the analytical sample was 99,137 persons.



### ***Study outcome***

The outcome variable, NEET status, was based on information from Statistics Finland on the main activity during the year when turning age 18. Those who were not employed, students, disability pensioners or in military/non-military national services were defined as NEET. To capture the more vulnerable part of the NEET population, NEET was measured at the age of 18. At this age, most of the youth are in upper secondary school and NEET status is least common.

It has been suggested that unemployed jobseekers should be excluded from NEET definitions (Serracant 2014). However, since few 18-year-olds in Finland have graduated from secondary school and thus have poor employment prospects, the unemployed were included among NEET. Teenage parenting is rare in Finland, but those caring for children at home were included in the NEETs since there is evidence that having children at a very young age is associated with similar family background factors and might also relate to similar future outcomes as being NEET (Imamura et al. 2007).

Youth who are outside education or employment for longer periods are likely to be the most vulnerable group among NEETs. To test for the effect of duration of being NEET, the analyses were repeated using NEET at both 18 and 19 as the outcome. The results were largely similar (Appendix 2.)

### ***Independent variables***

Parental education, unemployment and household income were used as measures of parental socioeconomic resources, and parental psychiatric disorders and substance abuse, parental death, out-of-home placement and living in a single-parent household as measures for adverse childhood experiences. Childhood variables were measured from

the years the children were 0–12 years old, except for the 1986 cohort for which, due to data limitations, the measurement age was 1–12.

Parental education was measured from either the biological father or mother, depending on which of the parents had higher qualifications, and classified into tertiary, secondary and basic education.

The household income variable was constructed using information on household income subject to state taxation. Income for each year was adjusted for inflation and converted into the euro value of 2012 using a currency conversion table from Statistics Finland (2012), and divided by consumption units using the modified OECD scale (first adult aged 18 and over contributes 1, other over 13-year-olds 0.7 and 13-year-olds or younger 0.3 (Eurostat 2018a)). Mean household income for the whole childhood period was calculated and divided into quintiles.

Children were considered to have experienced parental unemployment if either one of their biological parents had been unemployed over 6 months during a calendar year. The variable was classified into three categories: no parental unemployment, experienced unemployment during 1–4 years and experienced unemployment during 5 or more years of childhood.

To identify parental psychiatric disorders or substance abuse, we used hospital discharge records classified according to versions 9 and 10 of the International Classification of Diseases and Causes of Death and data on purchases of prescription medication classified according to the Anatomical Therapeutic Chemical Classification System. Main diagnoses of hospitalisation due to mental or behavioural disorders and purchases of psychotropic medication were used to identify parental psychiatric disorders. Similarly, substance abuse was identified by using the main diagnoses of hospitalisations related to alcohol and substance abuse and medications for alcohol and

opioid dependencies. The corresponding codes for main diagnoses and medications are presented in Appendix 1. Both of the variables were categorised into no childhood experience of either parent's psychiatric disorder or substance abuse, either parent's purchase of medication (but no inpatient care), and either parent hospitalised.

Hospitalisation data were available for all the cohorts during the childhood measurement period. Medication data were available only from 1995 onwards, therefore the parental purchases were measured between ages 9–12 to achieve a symmetrical measurement period across cohorts.

For parental death and living in a single-parent household, dummy indicators were used. Children were classified as living with a single parent if they had been living with a single mother or father at some point during childhood. Parental death was considered as occurring in childhood if the parent had died while the child was 0–12 years old. The indicator for out-of-home placement was formed using child welfare records. All of those who had any records of placement were defined as being placed outside the home, regardless of the cause or duration of placement.

### ***Modelling strategy***

We used logistic regression models to study the associations between childhood experiences and NEET. All models were controlled for year of birth, sex, native language, the region of residence at the age of 18 and a variable indicating if the child had information on both biological parents.

Model 0 shows the associations between NEET and each independent variable. To illustrate the relationship between different aspects of socioeconomic status in childhood and NEET, in Model 1 all of the three measures for parental socioeconomic resources were entered into the model simultaneously. Model 2 shows mutually adjusted associations of parental substance abuse, psychiatric disorder and death of a

parent, and in Model 3, these mutually adjusted health-related measures were controlled for all of the parental socioeconomic resources. Model 4 includes indicators for living in a single-parent household and out-of-home placements, and in Model 5 these associations were further controlled for parental socioeconomic resources. Finally, Model 6 includes all of these childhood measures simultaneously. In order to identify possible differences in the associations between boys and girls, we tested for interaction effects between sex and each childhood variable in Models 0 and 6.

## **Results**

The prevalence of NEET at age of 18 was approximately 3% (girls 3.1%, boys 3.0%). The proportions of NEET were the largest among young people coming from the most socioeconomically disadvantaged backgrounds (Table 1). Among those with no secondary-educated parent, the share of NEET was over four times larger (9.1%) than among those with tertiary-educated parents (1.7%). In the category of children who experienced parental unemployment during five or more years of childhood, the share of NEETs was three times larger than among children whose parents had not been unemployed. In addition, there was a clear association between household income and NEET: the proportion of NEET was four times higher in the lowest quintile of childhood income when compared with the highest quintile.

The shares of NEET were approximately 1.5–2 times larger among youth who had experienced parental hospitalisation due to psychiatric disorders or substance abuse as compared to those who had not, but the proportions of NEET did not differ by parental death. Among those who had lived with a single parent, being NEET was two times more common than among those from intact families. In the group of out-of-home placements, the share of NEET was approximately 4 times larger than in the group without records in the child welfare register.

In Model 0, all the childhood variables, except parental death, showed statistically significant associations with being NEET at age 18 (Table 2, odds ratios for control variables in Appendix 3.). In the lowest categories of the socioeconomic variables, odds ratios ranged from 3 to 5. The experience of parental hospitalisation due to psychiatric disorder or substance abuse increased the odds of being NEET by 80–100%. Among those whose parents had only purchased prescription medication, the odds ratios were lower. Out-of-home placement tripled the odds of being NEET when compared with the group of no placement history, whereas living with a single parent more than doubled the odds.

In model 1, all the variables measuring parental socioeconomic resources had statistically significant independent associations with NEET status. Among the children from the most socioeconomically disadvantaged families, the odds ratios were 1.90–3.47.

In Model 2, parental psychiatric disorder and substance abuse had statistically significant associations with NEET, whereas parental death did not. Parental hospitalisation due to substance abuse increased the odds of NEET by 71% and hospitalisation for psychiatric disorder by 53%. For those whose parents were solely treated by medication, the odds ratios were more moderate. Adjusting for parental socioeconomic factors in Model 3 explained the association between parental substance abuse and NEET and the association between parental psychiatric disorder and NEET was greatly attenuated. Parental death had a statistically significant negative association with NEET status in Model 3.

In Model 4, the odds of NEET were approximately doubled if the child had experienced out-of-home placement or lived with a single parent. After controlling for socioeconomic resources in Model 5, these associations were largely attenuated.

Model 6 included all the childhood variables. The odds ratios of socioeconomic factors were similar to ratios in Models 1, 3 and 5. Parental psychiatric disorder or substance abuse did not have statistically significant associations with NEET in Model 6. Living in a single-parent household during childhood and out-of-home placements still predicted NEET: the odds were similar to Model 5, suggesting that further adjustment for parental health had little effect on these associations. As in Model 3, parental death had statistically significant negative association with NEET in Model 6.

Interaction between sex and all of the childhood variables was tested in Model 0s and Model 6. The only statistically significant interaction was between sex and parental education, which was further deconstructed by estimating predicted probabilities of NEET status by sex and parental education. According to the results (Figure 1), tertiary education of parents was more protective against being NEET among boys than among girls, but the differences by sex in predicted probabilities were rather small.

## **Discussion**

We explored the childhood determinants of not being in education, employment or training (NEET) at the age of 18. Using high-quality register data with a wide range of indicators measured in the early life course, clear associations between socioeconomic family background, adverse childhood experiences and NEET status were found. According to our results, a disadvantageous family background, low parental socioeconomic resources in particular, increases the risk of falling outside the educational system and labour market during the transition to adulthood, which indicates inequalities in opportunities among youth.

The clear link between the parental socioeconomic resources and NEET status found in this study is in line with previous evidence on the higher proportions of NEET

youth among socioeconomically disadvantaged families (Bynner and Parsons 2002; Duckworth & Schoon 2012; Dorsett and Lucchino 2014). The effect size of parental education found in this study was high when compared to the results of Duckworth and Schoon (2012) for NEET status at age 18 in the UK. In their study, low parental education increased the odds of NEET by about 30%, whereas in this study, the odds were tripled. In the same study, parental unemployment increased the odds of NEET by 30%, whereas our analysis showed a 60% increase in the odds (parent unemployed during five or more years of childhood). The prevalence of NEET at 18 in the UK study was 16% (for the cohort born 1989/90), whereas merely 3% in this study, thus possibly identifying a much more selected group in the Finnish data. The size of odds ratios of parental education in our results were similar to a Danish study on socioeconomic background and school dropout (Winding and Andersen 2015), possibly reflecting similarities in youth transitions in the Nordic countries.

Being NEET has previously been related to low levels of parental material resources, in terms of social housing and state-provided benefits (Duckworth and Schoon 2012; Bynner and Parsons 2002; Schoon 2014). However, previous studies on secondary education completion have concluded that family income is not a decisive factor for not completing secondary education (Vauhkonen et al. 2017; Bukodi and Goldthorpe 2013; Kallio, Kauppinen, and Erola 2016). In contrast, our findings suggest that low income is strongly related to NEET: being in the lowest income quintile more than doubled the odds of NEET across all the models in which other socioeconomic resources were controlled for.

Vauhkonen et al. (2017) and Kallio, Kauppinen, and Erola (2016) have shown that having parents who receive social assistance increases the risk of school dropout in Finland. Thus, it seems reasonable to argue that low parental economic resources

increase the risk of NEET even in a Nordic welfare state, where there are no tuition fees. In practice, secondary education does have costs: on the academic track, students need to purchase learning materials and full-time studying limits employment opportunities.

Our results show that different types of parental socioeconomic resources are all related to NEET, even when measured during early childhood years, not just the near proximity of transition to education and employment. To our knowledge, this is the first study to show the association of parental socioeconomic resources in earlier childhood years with NEET at adolescence. In addition to disposable economic resources, these associations might be explained by several mechanisms. Firstly, highly-educated parents tend to have better information on the benefits of education (Vauhkonen et al. 2017). Secondly, values and attitudes related to education and employment are internalised during childhood and can also be actively imposed on children by their parents, producing aspirations differing by socioeconomic status (Vaisey 2010; Yates et al. 2011; Jæger and Holm 2007). Thirdly, parental stress due to lack of sufficient income and unemployment can affect parenting capabilities (Masten and Shaffer 2006). Genetic inheritance of cognitive abilities may also explain the association to some extent.

Parental psychiatric disorder and substance abuse, out-of-home placement and living in a single-parent household increased the probability of being NEET when compared with those not exposed to these events. The results suggest that adverse experiences in childhood contribute to problematic transitions and are in line with previous findings on the associations between childhood adversities and socioeconomic attainment during the life course (Bäckman and Nilsson 2011; Veldman, Bültmann, et al. 2015; Wickrama et al. 2008). However, to our knowledge, these associations



between a broad range of adverse childhood experiences and NEET have not previously been studied.

Parental support (Alfieri et al. 2015) and interest towards education (Bynner and Parsons 2002) have been shown to protect against NEET, which may act as mediating mechanisms between adverse childhood experiences and NEET: parental psychiatric disorder and substance abuse are likely to hamper these parenting capabilities. In a similar vein, lower socioeconomic resources in a single-parent household may increase stress and affect parenting (Erola and Jalovaara 2017). Children living in dysfunctional families and witnessing intrafamilial conflicts may also be exposed to increased levels of stress, which might lead to development of adolescent psychiatric disorders (Björkenstam et al. 2016). These disorders might in turn act as a pathway to NEET (Veldman, Reijneveld, et al. 2015).

The rather counter-intuitive protective association between parental death and NEET is likely to be related to the measurement of the other childhood variables. Because most of the childhood variables were constructed by combining information from both biological parents, death of a parent is likely to affect the probabilities of falling into the categories of other independent variables measured in childhood. This conclusion is supported by the fact that parental death only had statistically significant association in the models that were adjusted for socioeconomic resources in Model 5 and further for other adverse experiences in Model 6. However, this could also be a sign of developed resilience or better access to social services after parental death, which might be worth exploring in more depth with a more suitable study design that accounts for socioeconomic resources and other types of adverse experiences simultaneously.

The childhood determinants of NEET status in this study were strongly related to socioeconomic mechanisms, whereas the associations between adverse childhood

experiences were modest when compared to the parental socioeconomic resources. Furthermore, these associations were strongly attenuated after adjustment for socioeconomic resources, which was especially pronounced with parental psychiatric disorder and substance abuse. Therefore, NEET seems to be more strongly determined by parental socioeconomic resources than adverse childhood experiences, which has not been pointed out before.

Previous literature suggests that socioeconomic disadvantage is often correlated with different types of other adverse childhood experiences (Bäckman and Nilsson 2011). Therefore, the observed associations, when not controlled for parental socioeconomic resources, might reflect the levels of parental resources among those exposed to childhood adversities. According to Bäckman and Nilsson (2011), parental socioeconomic disadvantage might be more strongly related to lower educational attainment than deviant behaviour in adolescence, whereas adverse experiences would increase the risk for the latter. NEET is an indicator for labour-market activity and might thus be better explained by socioeconomic determinants, not experiences possibly more relevant for the development of psychiatric disorders or juvenile delinquency, for instance. This conclusion calls into question, to some extent, using NEET as a measure of youth exclusion, and is parallel to previous critique of NEET (see, e.g., Yates and Payne 2006).

According to the interaction analysis, the impact of family background on NEET seems not to be modified by gender to a great extent, which is in line with the results of Schoon (2014). Nevertheless, having tertiary-educated parents was more likely to reduce the likelihood of NEET among boys than among girls, which is a novel finding. Gender differences among NEETs have often been explained by teenage pregnancies (Yates et al. 2011; Bynner and Parsons 2002). In Finland, the number of teenage parents

is quite low (during the 2000s, under 3% of all the annually born children were born to under 20-year-old mothers (National Institute for Health and Welfare 2017)), which suggests that there could be other mechanisms at play.

The lower risk of NEET for boys among tertiary-educated parents might be related to gender roles, which have been argued to be more rigid for boys, thus producing more achievement-driven aspirations for boys among children of tertiary-educated parents (Kleinjans 2010). Psychiatric disorders in adolescence are also more common among girls (Zahn-Waxler, Shirtcliff, and Marceau 2008), and it can be speculated that highly-educated parents may demand more from their children, which could cause psychiatric disorders through low self-esteem and feelings of underachievement, and lead to being NEET. However, assessment of these mechanisms would require a more accurate definition of NEET by leaving out all teenage parents and controlling for individual mental health history. In the end, the interaction effect might only be a chance finding due to multiple testing, the considerably rare outcome and small subgroups in interaction analysis.

### ***Policy implications***

Our results suggest that to reduce problematic transitions to education and employment and inequality of opportunities during the transition to adulthood more generally, supportive measures should be implemented already during childhood. These might include, for instance, increased co-operation between families and schools, household and financial assistance for parents with less resources, or family counselling. Youth from disadvantaged backgrounds might also benefit from intensive school counselling and a more diverse range of options to attain secondary education, including e.g. apprenticeship training and internships.

Apart from targeted interventions, increase in the mandatory age of school leaving and cost-free secondary education might further reduce the rate of NEET among disadvantaged families. These universal measures might be effective: the prevalence of NEET in this study was quite low, approximately 3%, which indicates that the Finnish system with almost cost-free secondary education (students need to pay for learning materials) is quite efficient in placing youth into the educational system after compulsory school.

It has been argued that the discussion on youth not in education or employment focuses more on individual attributes rather than structural constraints, which might lead to flawed labour market policies and negative labelling of young people (Serracant 2014, Thompson 2011). According to Thompson (2011), individual factors and choices are related to NEET but these cannot be separated from structural factors from which they arise. Our results support this view since we show clearly that NEET is dependent on socioeconomic background and adverse childhood experiences, which indicates that social context and life histories have a large role to play among youth not in education or employment. Therefore, NEET might be a useful indicator of social disadvantage among young people, if the population of interest is limited to those most vulnerable. In this study, we reduced the heterogeneity of NEET by measuring the status at the point when most of the Finnish youth are in secondary education but have not yet completed their schooling. However, our definition might not apply in different social context.

### ***Methodological considerations***

There were several strengths in this study. First, register data is free from the challenges of non-response, recall bias and response tendencies inherent in survey designs. Thus, the acquired results are highly reliable at the population level. Reaching children from lower socioeconomic positions through surveys might be particularly challenging

(Schoon 2014), and this is likely to apply also to NEETs. In this study, it was possible to use annual data from the first 13 years of childhood for nearly 100,000 individuals and accurately link children with their biological parents.

It should be noted that the definition of some of the variables might affect the results. Adverse childhood experiences were measured as ever experienced, which does not capture recurrence or persistence of the stressful life situation. Furthermore, using hospitalisation discharges and purchases of prescription medicines as proxies does not catch all these disorders. On the other hand, hospitalisation in particular can be considered as an indicator of the most severe psychiatric disorders and substance abuse, thus, the bias relating to how the variable was defined is hardly crucial in nature.

Moreover, for all of the parental variables, information on biological parents was used. The fact that the parent might not reside with their children may lessen the negative effects on NEET. In addition, for some of the children the measurement of parental variables is somewhat asymmetrical because data on both of the parents were not available.

We did not control for individual attributes of the studied youth, such as psychiatric disorders, substance abuse or criminality. These individual challenges during adolescence might moderate the family background associations. Furthermore, the life situations of NEETs at 18 are considerably different from older NEETs, and the outcome used in this study captures those with challenges mainly related to educational system. These aspects should be further studied with longitudinal and intergenerational designs to acquire more empirical evidence on the topic.

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Table 1: The distributions of parental socioeconomic resources and adverse childhood experiences, and proportions of NEET at 18 (%) in the categories of childhood variables.

	Total		Boys		Girls	
	%	% NEET	%	% NEET	%	% NEET
<i>Education of parents</i>						
Tertiary	51.0	1.7	51.0	1.5	51.0	1.9
Secondary	42.5	3.7	42.4	3.7	42.5	3.7
Basic	6.6	9.2	6.6	9.9	6.5	8.5
<i>Parental unemployment</i>						
No unemployment	50.0	2.0	49.9	2.0	50.1	2.1
During 1-4 years	34.8	2.9	34.8	2.8	34.7	3.0
During 5 or more years	15.3	6.7	15.3	6.6	15.2	6.7
<i>Household income quintiles</i>						
Highest	20.0	1.5	20.2	1.4	19.8	1.6
4th	20.0	1.8	19.6	1.7	20.4	2.0
3rd	20.0	2.4	20.0	2.5	20.0	2.4
2nd	20.0	3.1	20.1	3.0	19.9	3.2
Lowest	20.0	6.4	20.1	6.3	19.9	6.5
<i>Parental psychiatric disorder</i>						
No	72.8	2.8	73.0	2.7	72.5	2.8
Medication only	22.1	3.6	21.9	3.4	22.3	3.7
Hospitalised	5.2	5.1	5.1	4.7	5.2	5.4
<i>Parental substance abuse</i>						
No	94.3	2.9	94.3	2.8	94.4	3.0
Medication only	1.3	5.0	1.3	4.5	1.3	5.5
Hospitalised	4.4	6.0	4.5	5.9	4.4	6.0
<i>Parental death</i>						
No	97.4	3.0	97.4	3.0	97.4	3.1
Yes	2.6	3.4	2.7	3.1	2.6	3.7
<i>Living with single parent</i>						
No	68.5	2.2	68.3	2.1	68.7	2.3
Yes	31.5	4.9	31.7	4.9	31.3	4.9
<i>Placed outside home</i>						
No	98.1	2.9	97.9	2.8	98.2	3.0
Yes	1.9	10.9	2.1	11.0	1.8	10.7
<i>N</i>	99,137	3,023	50,684	1,506	48,453	1,517

Table 2: Associations between parental socioeconomic resources, adverse childhood experiences and NEET status at 18. Results from logistic regression analyses. Odds ratios (OR) & 95% confidence intervals (CI) (for Models 0 and 6) (N=99,137).

	Model 0			M1	M2	M3	M4	M5	Model 6	
	OR	95 % CI		OR	OR	OR	OR	OR	OR	95 % CI
<i>Parental education</i>										
Tertiary (ref.)	1.00			1.00		1.00		1.00	1.00	
Secondary	<b>2.27</b>	2.08	2.47	<b>1.61</b>		<b>1.61</b>		<b>1.60</b>	<b>1.61</b>	1.47 1.76
Basic	<b>5.33</b>	4.77	5.95	<b>3.00</b>		<b>2.99</b>		<b>2.91</b>	<b>2.94</b>	2.60 3.32
<i>Parental unemployment</i>										
No unemployment (ref.)	1.00			1.00		1.00		1.00	1.00	
During 1-4 years	<b>1.49</b>	1.36	1.63	<b>1.16</b>		<b>1.15</b>		<b>1.12</b>	<b>1.12</b>	1.02 1.23
During 5 or more years	<b>3.57</b>	3.26	3.91	<b>1.78</b>		<b>1.74</b>		<b>1.63</b>	<b>1.61</b>	1.45 1.80
<i>Household income quintiles</i>										
Highest (ref.)	1.00			1.00		1.00		1.00	1.00	
4th	<b>1.37</b>	1.17	1.60	1.14		1.14		1.12	1.12	0.95 1.31
3rd	<b>1.91</b>	1.65	2.21	<b>1.39</b>		<b>1.39</b>		<b>1.34</b>	<b>1.33</b>	1.14 1.56
2nd	<b>2.52</b>	2.18	2.90	<b>1.60</b>		<b>1.59</b>		<b>1.49</b>	<b>1.49</b>	1.27 1.73
1st	<b>5.28</b>	4.63	6.01	<b>2.59</b>		<b>2.56</b>		<b>2.31</b>	<b>2.29</b>	1.96 2.67
<i>Parental psychiatric disorder</i>										
No (ref.)	1.00				1.00	1.00			1.00	
Medication only	<b>1.29</b>	1.18	1.40		<b>1.22</b>	<b>1.11</b>			1.17	0.90 1.52
Hospitalized	<b>1.86</b>	1.63	2.12		<b>1.52</b>	<b>1.16</b>			0.96	0.83 1.12
<i>Parental substance abuse</i>										
No (ref.)	1.00				1.00	1.00			1.00	
Medication only	<b>1.75</b>	1.35	2.26		<b>1.56</b>	1.25			1.07	0.98 1.16
Hospitalized	<b>2.09</b>	1.83	2.38		<b>1.78</b>	1.07			1.05	0.90 1.22
<i>Parental death</i>										
No (ref.)	1.00				1.00	1.00			1.00	
Yes	1.14	0.92	1.41		0.91	<b>0.80</b>			<b>0.69</b>	0.55 0.86
<i>Living with a single parent</i>										
No (ref.)	1.00						1.00	1.00	1.00	
Yes	<b>2.11</b>	1.96	2.27				<b>1.98</b>	<b>1.32</b>	<b>1.35</b>	1.24 1.47
<i>Out-of-home placement</i>										
No (ref.)	1.00						1.00	1.00	1.00	
Yes	<b>3.51</b>	3.01	4.08				<b>2.61</b>	<b>1.45</b>	<b>1.48</b>	1.25 1.75

Model 0: Each independent variable separately, adjusted for sex, year of birth, native language and region of residence at 18.

Model 1: Socioeconomic variables, adjusted as Model 0

Model 2: Parental health variables, adjusted as Model 0

Model 3: Model 1 + Model 2

Model 4: Out-of-home placement + living with single parents, adjusted as Model 0

Model 5: Model 1 + Model 4

Model 6: Model 1 + Model 2 + Model 4

Figures in bold are statistically significant at 95 % or higher confidence level (p<0.05)

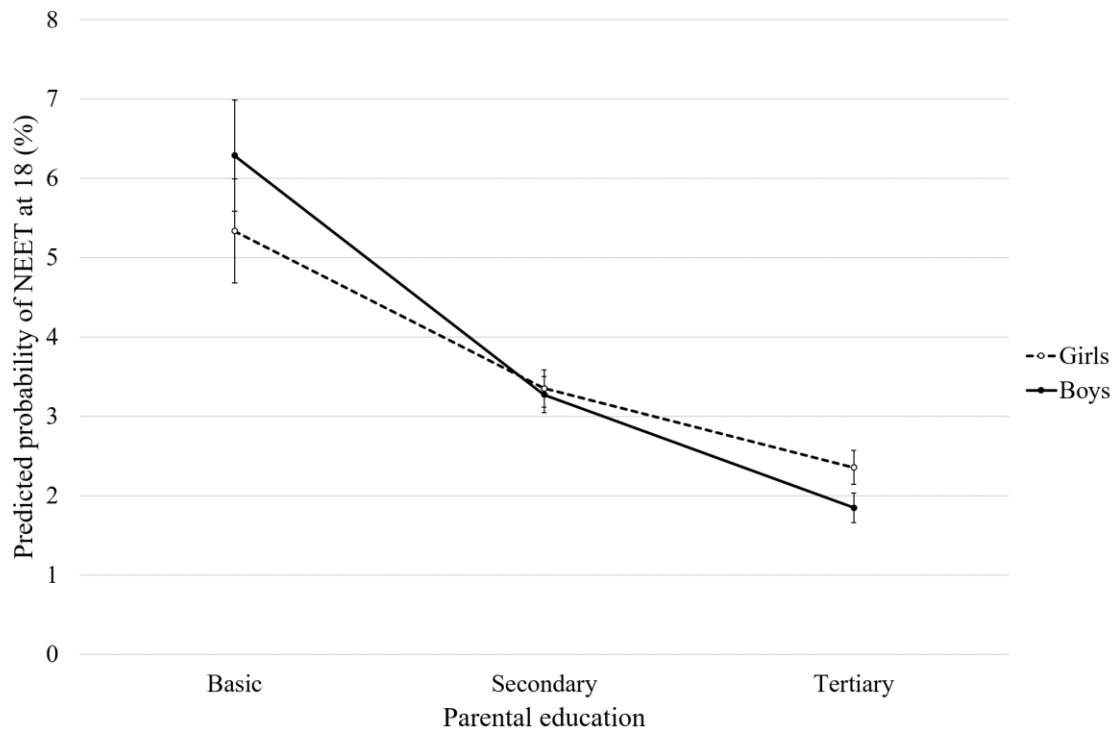


Figure 1: The association between parental education and NEET, by sex. Predicted probabilities of NEET at 18 (N = 99,137).