Health and socioeconomic circumstances over three generations as predictors of youth unemployment trajectories

David Teye Doku[1,2], Paulyn Jean Acacio-Claro[1], Leena Koivusilta[3], Arja Rimpelä[1,4]

1 Faculty of Social Sciences, Health Sciences and PERLA (Tampere Centre for Childhood, Youth and Family Research), University of Tampere, Tampere, Finland
2 Department of Population and Health, University of Cape Coast, Cape Coast, Ghana
3 Department of Social Research, Faculty of Social Sciences, University Turku, Finland
4 Department of Adolescent Psychiatry, Tampere University Hospital, Pitkäniemi, Finland

Correspondence: David Teye Doku, Faculty of Social Sciences, School of Health Sciences, Tampere University, PO Box 100, Tampere 33014, Finland, Tel: +358 50 50 99009, e-mail: daviddoku@gmail.com

Background: Youth unemployment is a critical life event, which may trigger other labour market-related disadvantages and detrimental health implications. To better understand the processes causing unemployment, we study how socioeconomic circumstances of successive generations and familial and health factors in adolescence predict youth unemployment trajectories between ages 16 and 28 in Finland from 2000 to 2009. **Methods:** We used survey data from 1979 to 1997 on 12- to 18-year-old Finns ($n = 43\,238$) linked with 1970–2009 registry-based data of their grandparents, parents and themselves. Growth mixture modelling and multivariate logistic regression analyses were used. **Results:** Three latent youth unemployment trajectories emerged; low (46%), decreasing (38%) and high (16%) risk groups. Of adolescent factors, low school achievement was the most important predictor of youth unemployment followed by smoking, stress symptoms and poor self-rated health. Grandparents' education predicted their grandchildren's unemployment but the effects of other grandparental socioeconomic circumstances mediated through parents' socioeconomic status (SES). Parents' low SES and education, and long-term unemployment increased the risk of the child's unemployment. Youth unemployment was related to low education at the age of 29. **Conclusion:** Grandparents' education, family socioeconomic circumstances and adolescents' health and school achievement predict the developmental trajectory of youth unemployment. Youth unemployment is also related to low education in early adulthood. Our findings suggest that the health selection of unemployment works already in adolescence.

Introduction

Young people are among those who bear the greatest brunt of unemployment.[1,2] As a critical life event, youth unemployment may trigger other labour market disadvantages, such as long-term job insecurity, downward occupational mobility and a failure in getting an active role in the society.[1–3] Unemployment may also have long-lasting effects on well-being[3] and it is associated with mortality,[4] poor mental health,[5,6] alcohol abuse,[7] smoking,[8,9] other drug uses[10,11] and poor physical health.[6] Youth unemployment may even have stronger health implications than adult unemployment.[12] On the other hand, unemployment is known to be related to socio-economic factors.[13] In this article, we study relations between youth unemployment, health in adolescence and socioeconomic factors over three generations.

Two pathways have been suggested to explain the link between unemployment and health.[14,15] Unemployment may deteriorate health and increase the risk of health-compromising behaviours like smoking or alcohol use; or poor health may affect a person's labour market prospects and consequently increase the risk of unemployment.[12–17] The latter is called health selection. Health selection among adults has been demonstrated, e.g. in a study, where smokers' chances for re-employment were smaller than those of non-smokers.[17] During the life course, health and unemployment may also intertwine.[13,14]

Adolescence is a stage in the life course where health selection to later unemployment trajectories may start due to the strong relations between health factors and educational achievements at that age. In adolescence, many health-compromising behaviours like smoking or drinking are adopted and educational paths are selected. Health-compromising behaviours and poorer health are associated with poorer school achievements and short education in adulthood.[18–20] This may suggest that poor health-related factors in adolescence and poor school achievements in adolescence predict later unemployment. A study of the current trends of youth unemployment in European Union countries reported higher unemployment rates among persons with less than upper secondary school compared with their better-educated counterparts.[19]

Unemployment is associated with socioeconomic status (SES) to the disadvantage of those with low SES.[13,21–25] It has also been shown that low SES during childhood increases the risk of later unemployment, and that low parental circumstances associate with the likelihood of unemployment of the child in early adulthood.[22] Even if own SES in adolescence is not established, academic achievement in school is a strong predictor of a child's education in adulthood. Further, even in welfare societies like Finland, parents' education level and SES predict children's academic achievements and choice of education tracks.[26] A potential path to unemployment in later adolescence or adulthood can start even in childhood through the

family circumstances. No study has looked at the socioeconomic circumstances of grandparents in relation to their grandchildren's unemployment. With the increasing life expectancy, adolescents' have grandparents more often than earlier, which is why more interactions between grandparents and their grandchildren can be expected.[27] This also implies that the socioeconomic circumstances of the grandparents may have a more direct influence on their grandchildren and their lifestyles above the mediating effects through parents now than in the past.[21,28]

We study here if health factors in adolescence, including health behaviours, predict unemployment in young adulthood and thus suggest a health selection effect. Further, we study if family socioeconomic factors are associated with youth unemployment. Here 'family' covers both parents and grandparents. The unemployment trajectories between ages 16 and 28 are studied in the cohorts, which were at that age between 2000 and 2009.

Methods

Study design and data

A longitudinal dataset was constructed by linking survey data from the Adolescent Health and Lifestyle Surveys (AHLS) with census and registry data from Statistics Finland concerning the survey participants and their parents and grandparents. In AHLS, the mailed surveys were conducted using comparable questions in 1979, 1985, 1987, 1991, 1993, 1995 and 1997 ($n = 43\ 232$) among nationally representative samples of 12-, 14-, 16- and 18-year-old drawn from the Population Register Centre.[26] The overall response rate was 78.1% ($n = 43\ 232$), for girls 85.8% ($n = 23\ 179$) and 70.8% ($n = 20\ 059$) for boys.

Statistics Finland had constructed the family formation data to link generations. These data were drawn from national censuses collected every fifth year from 1970 to 1995 and annually through national registries from 2000 to 2009. Our dataset had information on all available six censuses and from 2000 onwards each year. That is why we were able to select, e.g. socioeconomic circumstances for parents and grandparents so that they matched the survey ages. Because censuses were every fifth year, we chose the nearest measurement to the adolescent's age of 15 years. However, in the earlier censuses, families could not be formed, if children (in this study parents) were no longer living with their parents (in this study grandparents). This explains the large number of missing grandparents. The response rate in the AHLS was slightly higher among adolescents who had no grandparents (80.2%) compared with those who had at least one (78.6%). The proportion of youth unemployment was slightly lower among those with no grandparents compared with those who had at least one ($P < 0.01$).

Participation in the AHLS was voluntary. Statistics Finland linked the datasets in accordance with a contract specifying the rights and duties of both parties. The Institutional Review Board of Statistics Finland and the Data Protection Ombudsman approved the study protocol. Identification of the study participants was withheld from the investigators at all stages of the study. The Joint Commission on Ethics of the University of Turku and the Turku University Hospital stated that no human rights were violated in the research protocol and approved it.

Variables extracted from the statistics Finland registers

'Youth Unemployment' for each year from 2000 to 2009 was measured as the number of months of unemployment during year each calendar year. Less than 14 days of unemployment was coded as 0 months.

Socioeconomic circumstances

Six measures of socioeconomic circumstances were used for parents and grandparents using the classifications of Statistics Finland Statistics Finland.[29] Censuses or registry data within 5 years of the child's 15th birthday, nearest to that were chosen. Grandparents' information from paternal and maternal sides was combined. If both grandparents belonged to the same category of socioeconomic circumstances, this category was used. Otherwise, the higher category was selected.

SES was classified as upper white-collar, lower white-collar, blue-collar, agricultural entrepreneur, other (pensioners, students, those in military service) and unknown. For parents, the unknown category also included those who had died before the AHLS survey.

Education level

The education level of parents and grandparents was classified according to years of schooling: low (9 years or less), middle (10–12 years) and high education (over 12 years).

'Material resources' were measured by the ownership of the dwelling classified as owner-occupied, rented or unknown (no information/parents had died).

'Father's and mother's unemployment', measured every fifth year from 1970 to 1995 and yearly from 2000 to 2009, refer to the sum of unemployment months during the preceding 12 months from each measurement year. The coding was the same as in youth unemployment. The categories were: not unemployed, unemployed ≤1 year (short-term), >1 year (long-term).

'Parents' divorce' within 5 years before or after the survey (yes/no) and 'death of parent(s)' by the time of the survey (yes/no) were used.

Education reached by age 29 for the survey participants was classified in the same way as for the parents and grandparents.

Variables from the AHLS

In the surveys, adolescents reported 'family structure': living with both parents (intact family) or not (non-intact). 'Father's and mother's smoking' were reported by their children: does not smoke, stopped smoking, or smokes.

'School achievement' was categorized as excellent, good, average, and poor. This was measured in the survey by asking the respondent's self-assessment of his/her school performance in the latest end-of-term school report compared with the class average. This was used for 12- to 14-year-old while for 16- to 18-year-old the type of school was used in addition as follows: excellent (academic upper secondary school with better school performance), good (academic upper secondary school with poor or average school performance), average (vocational school) and poor (not in school).[25] It was categorized from 12- to 14-year-old. In Finland, compulsory education ends at age 16, after which the adolescents can continue to academic or vocational upper secondary school or end their education.

'Adolescent smoking' was defined differently for each age group to reflect the process of smoking initiation in each age group; 12-year-old had smoked more than two cigarettes and 14-year-old more than 50 cigarettes in their lifetime; 16- to 18-year-old smoked daily. The 659 (1.2%) missing cases of smoking were excluded from the analysis. Of the smokers, 50.1% were girls.

'Drunkenness' described the alcohol intoxication habits of the respondents, categorized as never or does not drink alcohol, seldom or one to two times a month, and once a week.

'Chronic disease', injury or disability that restricts daily activities (no/yes).

'Stress symptoms' (stomach aches, tension or nervousness, irritability or outbursts of anger, trouble falling asleep or waking at night, headache, trembling of hands, feeling tired or weak, feeling dizzy), categorized as no symptoms, 1–3/week, and 4–8/week

'Self-rated health' categorized as very good, good to average, poor.

Statistical analysis

We estimated the trajectories of youth unemployment over time using exploratory growth mixture modelling (GMM). GMM is used for simultaneous identification of different empirically driven *post hoc* developmental patterns over a series of measurement points.[30] GMM is a special case of the growth mixture model, given the assumption of homogeneity of growth parameters within a latent subgroup.[31]

We tested several trajectories and selected the most suitable solution using the Akaike information criterion (AIC) and the Bayesian information criterion (BIC) value as well as the theoretical understanding of the trajectories.[32] We assessed the classification accuracy of the individuals by the value of entropy ranging between 0 and 1, where 1 is the best classification. We estimated one- to six-class solutions of youth unemployment. The BIC values for classes beyond six were small and the P-values in the Lo-Mendell-Rubin adjusted likelihood ratio test (LMR-LRT) were not statistically significant.[30] We chose the three-class model because it was statistically the most optimal in terms of the entropy values and also has statistically significant values for the LMR-LRT (Supplementary table S1). Also, the BIC and AIC values were not significantly different from the proceeding classes or those beyond. Furthermore, the three-class model was empirically meaningful with respect to the distribution of the latent structure of youth unemployment and there are no theoretical constraints for selecting this model.[31] Mplus statistical programme, version 7 was used to explore the latent classes.[30]

We used multinomial logistic regression analysis to study the associations of grandparental, parental and adolescent variables with youth unemployment trajectories. First, we studied the bivariate associations, separately for adolescents, parents and grandparents, adjusted for age at baseline, sex and duration of follow-up. Second, to investigate whether the associations between grandparents' circumstances and youth unemployment trajectories were mediated through parental socioeconomic circumstances, we conducted a multivariate analysis involving parental and grandparental socioeconomic circumstances (Supplementary table S2). Third, multivariate models involving all variables, which were statistically significant at the bivariate analysis, were fitted to study the independent associations

Table 1 ORs and their 99% CIs for the bivariate associations with youth unemployment trajectories and adolescent characteristics adjusted for age, sex and duration of follow-up

Variable $n = 43\ 238$	Decreasing risk group	High-risk group
Family structure		
Intact family (33 386)	1.00	1.00
Non-intact family (9624)	1.28 (1.20–1.37)	1.99 (1.83–2.16)
Parents divorced		
No (32 583)	1.00	1.00
Yes (10 465)	1.21 (1.13–1.29)	1.76 (1.62–1.90)
Death of parent(s)		
No (41 316)	1.00	1.00
Yes (1922)	1.18 (1.03–1.35)	1.57 (1.33–1.85)
School achievement		
Excellent (9225)	1.00	1.00
Good (12 567)	1.59 (1.47–1.72)	2.15 (1.88–2.45)
Average (15 117)	2.05 (1.90–2.21)	4.78 (4.22–5.41)
Poor (5840)	2.37 (2.14–2.62)	8.43 (7.33–9.70)
Education reached by age 29		
High (14 638)	1.00	1.00
Middle (24 344)	1.31 (1.24–1.39)	3.23 (2.93–3.55)
Low (4256)	1.35 (1.21–1.51)	7.80 (6.85–8.87)
Smoking		
No (32 436)	1.00	1.00
Yes (10 180)	1.39 (1.30–1.49)	2.22 (2.04–2.41)
Drunkenness		
Never (21 474)	1.00	1.00
1–2 times/month/seldom (19 997)	1.23 (1.06–1.20)	1.26 (1.15–1.37)
Once a week or more often (1300)	1.62 (1.35–1.93)	3.21 (2.63–3.91)
Chronic disease		
No (39 491)	1.00	1.00
Yes (3747)	1.04 (0.94–1.15)	1.24 (1.09–1.40)
Stress symptoms		
None (17 479)	1.00	1.00
1–3/week (20 424)	1.11 (1.05–1.18)	1.34 (1.23–1.45)
4–8/week (5335)	1.21 (1.11–1.33)	1.82 (1.63–2.05)
Self-rated health		
Very good (14 180)	1.00	1.00
Average or good (28 064)	1.33 (1.07–1.65)	2.45 (1.92–3.1)
Poor (809)	1.17 (1.11–1.25)	1.35 (1.25–1.47)

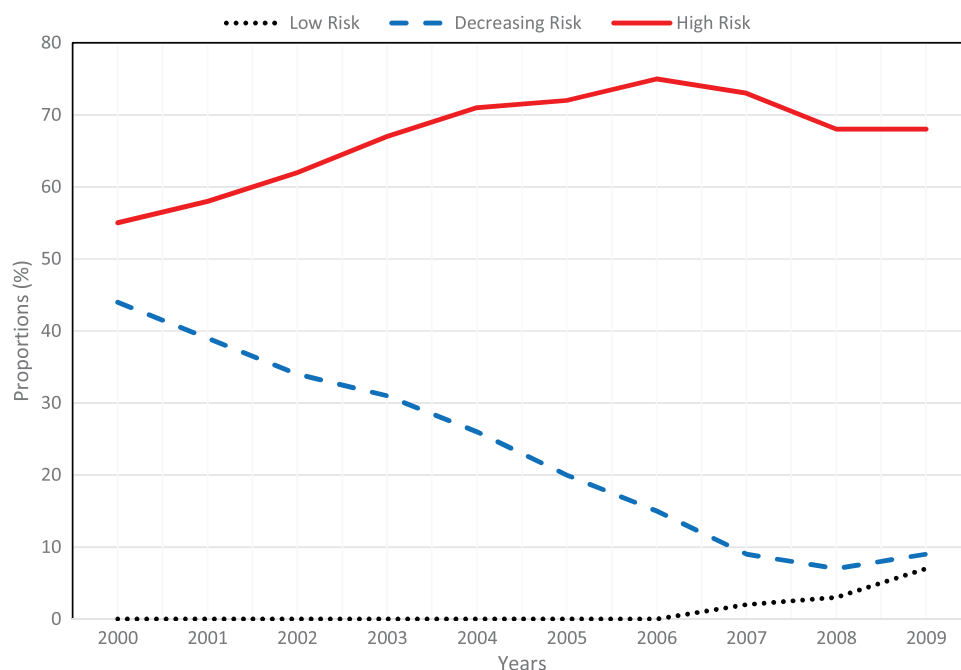The reference is trajectory of low-risk unemployment.

Figure 1 Proportions of youth unemployment trajectories in Finland from 2000 to 2009

Table 2 ORs and their 99% CIs for the associations of youth unemployment trajectories with their grandparents' (A) and parents' (B) socioeconomic circumstances, in bivariate multinomial logistic regression models, adjusted for age, sex and duration of follow-up

(A) Grandparents

Variable	Grandparents	
	Decreasing risk group	High-risk group
SES		
Upper white-collar	1.00	1.00
Lower white-collar	1.09 (0.90–1.32)	1.28 (0.98–1.66)
Blue-collar	1.42 (1.21–1.66)	1.91 (1.53–2.37)
Agricultural entrepreneurs	1.33 (1.12–1.58)	1.21 (0.95–1.55)
Others	1.24 (1.08–1.42)	1.42 (1.17–1.73)
Unknown	0.99 (0.86–1.14)	1.16 (0.95–1.42)
Education		
High	1.00	1.00
Middle	1.62 (1.42–1.85)	2.30 (1.84–2.87)
Low	1.88 (1.66–2.14)	3.09 (2.50–3.81)
Unknown	1.42 (1.25–1.61)	2.28 (1.84–2.82)
Dwelling		
Owner-occupied	1.00	1.00
Rented	1.06 (0.99–1.14)	1.41 (1.23–1.54)
Unknown/other	0.83 (0.79–0.87)	0.88 (0.82–0.93)

(B) Parents

Variable	Father		Mother	
	Decreasing risk group	High-risk group	Decreasing risk group	High-risk group
SES				
Upper white-collar	1.00	1.00	1.00	1.00
Lower white-collar	1.21 (1.11–1.32)	1.47 (1.29–1.68)	1.37 (1.27–1.48)	1.67 (1.48–1.88)
Blue-collar	1.55 (1.44–1.67)	2.52 (2.27–2.80)	1.74 (1.59–1.90)	2.90 (2.55–3.29)
Agricultural entrepreneurs	1.23 (1.09–1.37)	1.35 (1.13–1.60)	1.32 (1.17–1.50)	1.48 (1.23–1.78)
Others	1.85 (1.69–2.02)	3.88 (3.44–4.37)	2.02 (1.83–2.23)	3.96 (3.46–4.53)
Education				
High	1.00	1.00	1.00	1.00
Middle	1.70 (1.56–1.85)	2.78 (2.42–3.19)	1.83 (1.66–2.02)	2.90 (2.46–3.42)
Low	1.76 (1.61–1.91)	3.44 (2.99–3.95)	1.88 (1.69–2.08)	3.73 (3.15–4.42)
Dwelling				
Owner-occupied	1.00	1.00	1.00	1.00
Rented	1.32 (1.22–1.43)	2.14 (1.94–2.36)	1.33 (1.24–1.44)	2.24 (2.05–2.45)
Unemployment				
Not unemployed	1.00	1.00	1.00	1.00
≤1 year	1.29 (1.19–1.40)	1.47 (1.33–1.63)	1.29 (1.20–1.40)	1.51 (1.36–1.67)
>1 year	1.41 (1.31–1.52)	1.98 (1.81–2.16)	1.45 (1.36–1.56)	2.31 (2.12–2.51)
Smoking				
Does not smoke	1.00	1.00	1.00	1.00
Smokes/stopped smoking	1.19 (1.13–1.26)	1.52 (1.31–1.64)	1.24 (1.17–1.32)	1.73 (1.61–1.87)

The reference is trajectory of low-risk unemployment.

between youth unemployment trajectories and adolescents' parental and grandparental variables. The estimates of the multinomial logistic regression analyses were performed using the SPSS package, version 23 and are presented as odds ratios (ORs) with 99% CIs.

Results

The proportion of youth unemployment was lowest in 2007 (15.7%) and highest in 2000 (25.5%). We found three developmental classes (trajectories) of youth unemployment in Finland. The proportion of the youth in the first, second and third latent classes were 45.7% ($n = 19\ 779$), 15.9% ($n = 6858$) and 38.4% ($n = 16\ 601$), respectively. Correspondingly, the estimated probabilities (posterior probabilities) of belonging to these trajectories were 98.4, 88.7 and 86.2%, with entropy of 0.784 (Supplementary table S1). Figure 1 presents the proportions (%) of unemployed persons in the three trajectories marked as low, high and decreasing unemployment risk groups. The risk of

youth unemployment was <10% among the low-risk group throughout the period.

All adolescents' own factors were statistically significantly associated with both decreasing and high-risk youth unemployment trajectories in the bivariate models. The only exception was chronic disease, which was statistically significantly associated with only the high-risk unemployment trajectory (table 1). Clear gradients were found in associations of youth unemployment trajectories with most of the adolescents' own factors. School achievement in adolescence showed the strongest association with youth unemployment followed by education attainment at age 29. The odds for being in high-risk unemployment trajectory were nine times higher for those with poor school achievement compared with those with excellent achievement and eight times higher for low education attainment at age 29 compared with those who attained high at that age.

All grandparental variables were statistically significantly associated with unemployment in the bivariate models (table 2A). Adolescents whose grandparents were of lower SES were more likely

Table 3 ORs and their 99% CIs for the associations with youth unemployment trajectories and grandparents' and parents' (A), and adolescents' (B) circumstances

(A) Grandparents and parents

Variable	Grandparents			
Grandparents	Decreasing risk group	High-risk group	Decreasing risk group	High-risk group
Education				
High	1.00	1.00		
Middle	1.25 (1.04–1.51)	1.38 (1.01–1.90)		
Low	1.32 (1.11–1.58)	1.55 (1.14–2.09)		
Unknown	1.03 (0.86–1.24)	1.00 (0.99–1.02)		
Parents	**Father**		**Mother**	
SES				
Upper white-collar	1.00	1.00	1.00	1.00
Lower white-collar	1.02 (0.92–1.12)	1.16 (1.00–1.35)	1.08 (0.98–1.19)	1.12 (0.97–1.30)
Blue-collar	1.12 (1.03–1.23)	1.38 (1.21–1.57)	1.16 (1.04–1.30)	1.28 (1.09–1.50)
Agricultural entrepreneurs	1.07 (0.91–1.25)	1.07 (0.82–1.36)	1.05 (0.88–1.25)	1.10 (0.85–1.43)
Others	1.34 (1.20–1.49)	1.97 (1.70–2.28)	1.34 (1.19–1.51)	1.66 (1.40–1.96)
Education				
High	1.00	1.00	1.00	
Middle	1.21 (1.10–1.34)	1.20 (1.01–1.43)	1.18 (1.04–1.34)	n.s.
Low	1.18 (1.05–1.32)	1.19 (0.99–1.42)	1.08 (0.94–1.24)	
Unemployment				
Not unemployed	1.00	1.00	1.00	1.00
≤1 year	1.10 (1.00–1.19)	1.07 (0.95–1.20)	1.13 (1.05–1.23)	1.10 (0.98–1.23)
>1 year	1.16 (1.07–1.26)	1.28 (1.15–1.42)	1.22 (1.13–1.32)	1.51 (1.36–1.67)

(B) Adolescents

Variable	Decreasing risk group	High-risk group
School achievement		
Excellent	1.00	1.00
Good	1.48 (1.37–1.61)	1.69 (1.47–1.94)
Average	1.75 (1.60–1.91)	2.56 (2.22–2.94)
Poor	1.98 (1.75–2.23)	3.44 (2.92–4.05)
Education reached by age 29		
High	1.00	1.00
Middle	0.99 (0.92–1.06)	1.87 (1.67–2.08)
Low	0.82 (0.72–0.94)	2.99 (2.55–3.50)
Smoking		
No	1.00	1.00
Yes	1.15 (1.07–1.24)	1.28 (1.16–1.41)
Stress symptoms		
None	1.00	1.00
1–3/week	1.11 (1.04–1.18)	1.25 (1.14–1.37)
4–8/week	1.13 (1.02–1.25)	1.38 (1.21–1.58)
Self-rated health		
Very good	1.00	1.00
Average or good	1.08 (1.01–1.15)	1.10 (1.00–1.21)
Poor	1.16 (0.90–1.45)	1.64 (1.25–2.17)

n.s., not statistically significant.
Multivariate logistic regression models adjusted for age, sex and duration of follow-up. The reference is trajectory of low-risk unemployment.

to be unemployed compared with the grandchildren of upper white-collar employees. Also the lower the educational level of adolescents' grandparents, the higher the likelihood of them being unemployed. In addition, the odds of high-risk of unemployment were higher among adolescents whose grandparents lived in rented dwellings compared with those with grandparents living in dwellings they owned. However, the risk was lower for the offspring whose grandparents' dwelling status was unknown or who had dwelling other than owner-occupied or rented. All parental socioeconomic circumstances had a bivariate association with youth unemployment trajectories and the associations were stronger in the high-risk unemployment group than in the decreasing risk group (table 2B). Furthermore, those youth whose parents experienced unemployment were more likely to be at risk of unemployment themselves; and youth whose parents were

smokers or past smokers had higher likelihood of unemployment than those whose parents did not smoke.

In a multivariable model containing the parental and grandparental variables simultaneously, the associations of grandparental socioeconomic variables with youth unemployment were attenuated. Only the associations of maternal grandparental education and grandparental dwelling type with high-risk youth unemployment trajectories retained their statistical significance. This suggests that some of the effects of grandparents' socioeconomic circumstances on youth unemployment are mediated through the parents' (Supplementary table S2).

Final multivariate models with all parental, grandparental and adolescents' own factors are presented in table 3A and B. These results showed that adolescents' own factors had the strongest effects on youth unemployment trajectories, school achievement in adolescence

being the strongest one. The associations of youth unemployment with the parental and grandparental variables were attenuated considerably and most of them lost their statistical significance. Maternal grandparental education was associated with both decreasing and high-risk youth unemployment trajectories, while paternal education was associated with only the decreasing risk of youth unemployment trajectory. The association of parental SES, education, and duration of unemployment with youth unemployment trajectories remained statistically significant but weak.

Discussion

Our study revealed three developmental trajectories of youth unemployment in Finland, namely: low, decreasing and high-risk groups. The socioeconomic circumstances of grandparents, particularly education, predicted the youth unemployment trajectories of their grandchildren but some were mediated through parental socioeconomic circumstances. Low parental SES, education, and long-term unemployment were associated with the children's youth unemployment. School achievement was the strongest predictor of youth unemployment trajectories, along with smoking, stress symptoms and self-rated health. Youth unemployment was also associated with low education at the age of 29.

This study provides new evidence that the socioeconomic circumstances of grandparents and their education in particular are independently associated with youth unemployment, although parental socioeconomic circumstances mediate some of the effects of the grandparents. This finding supports earlier findings that suggest a transmission of behavioural and life style factors across generations.[28,33] Advantaged socioeconomic circumstances may protect children from the risk of unemployment.[34] Furthermore, because children of families with low SES tended to have a higher probability of long-term unemployment, successive generations in these families may regard unemployment as a normative lifestyle.[22–25]

Consistent with a previous study, we found negative associations of parental socioeconomic circumstances with unemployment among the offspring.[22] Children of higher SES have higher levels of social capital and network than those of lower SES, and higher levels of social capital and network are known to protect from unemployment.[34] Also, parental unemployment predicted unemployment among the children, suggesting an intergenerational transmission of the phenomenon. Parental unemployment may reduce the availability of resources in the family and, consequently, limit the opportunity for investment in the children's education. This can result in poor education and a cycle of unemployment within the family. A follow-up of the Finnish 1987 birth cohort found strong connections between the parent's and children's disadvantages in the labour force.[35,36] Parents disadvantage in the labour market, especially long absences predict children's disadvantage early labour market trajectory.[35] Parental unemployment can also lead to stigmatisation, which may produce a treadmill effect of unemployment in the family.[37]

We found associations of adolescent health-compromising behaviours and poor health with unemployment, which is evidence of health selection into unemployment trajectories.[14] This finding is consistent with a study from 11 European countries that found ill health to be an important determinant of maintaining employment.[38] Poor health is known to be associated with a lower likelihood of labour force re-entry after unemployment across all socioeconomic groups.[34]

One striking finding is the strong negative association of school achievement in adolescence with both decreasing and high-risk unemployment trajectories. In this study, school achievement measures, both the school performance as well as the educational path, that is whether one pursued higher education after high school or enrolled in a vocational school. Previous studies have found strong associations of low school achievement in adolescence with early school dropout and failure in transition to secondary education, as well as with health-compromising behaviours.[18–20] School achievement, measured with a comparison to class average, is a strong predictor of educational paths and attained educational level, showing its validity to measure school performance.[26] It predicts adult education level and, consequently, socioeconomic position in later life.[26] These mechanisms could explain the strong associations of school achievement in adolescence with youth unemployment trajectories. Furthermore, education attained by age 29 was also associated with decreasing and high-risk trajectories of unemployment.

Using large samples and nationally representative data with high response rates, this study provides robust evidence of developmental trajectories of youth unemployment in Finland from 2000 to 2009 as well as their predictors across three generations. There are some limitations. About half of the grandparents' data could not be linked to the data of their children and grandchildren because the database of Statistics Finland was not established until the 1970s. Analysis showed that the proportion of youth unemployment was slightly lower among those with no grandparents than among those who had at least one. It is unlikely that this difference would change the main results. We could not handle a possible small bias due to intra-generational clustering of siblings because the data did not contain that information. The AHLS variables were self-reported and, therefore, may be subject to bias.

Overall, our study underscores the role of both family socioeconomic circumstances and adolescents' health and school achievement as factors in the developmental trajectory of youth unemployment. Furthermore, the associations of unemployment with smoking, stress symptoms and self-rated health support the health selection hypothesis of unemployment. Reducing socioeconomic inequalities, investing in adolescents' education and addressing differences in health and health behaviours during early stages of the life course can contribute to reducing socioeconomic inequalities in health.

Supplementary data

Supplementary data are available at *EURPUB* online.

Key points

- Lower education and weaker socioeconomic circumstances of parents and grandparents, and parents' unemployment predict youth unemployment.
- Poorer school achievement in adolescence predicts youth unemployment, and attained education level by age 29 is associated with unemployment.
- Poor perceived health and health-compromising behaviours in adolescence predict your unemployment, which supports the health selection hypothesis.

- Our findings underscore the need to invest in adolescents' education and welfare policies to support families in order to prevent youth unemployment and its associated health implications.

References

1 OECD Economic Outlook. Persistence of high unemployment: what risks? What policies? *OECD Economic Outlook* 2011;2011:1. Available at: https://www.oecd.org/eco/labour/47656668.pdf (1 December 2017, date last accessed).

2 Björklund O, Söderlund M, Nyström L, Häggström E. Unemployment and health: experiences narrated by young Finnish men. *Am J Mens Health* 2015;9:76–85.

3 Darity W, Goldsmith AH. Social psychology, unemployment and macroeconomics. *J Econ Perspect* 1996;10:121–40.

4 Roelfs DJ, Shor E, Davidson KW, Schwartz JE. Losing life and livelihood: a systematic review and meta-analysis of unemployment and all-cause mortality. *Soc Sci Med* 2011;72:840–54.

5 Butterworth P, Leach LS, Pirkis J, Kelaher M. Poor mental health influences risk and duration of unemployment: a prospective study. *Soc Psychiatr Epidemiol* 2012;47:1013–21.

6 Egan M, Daly M, Delaney L. Adolescent psychological distress, unemployment, and the Great Recession: evidence from the National Longitudinal Study of Youth 1997. *Soc Sci Med* 2016;156:98–105.

7 Virtanen P, Janlert U, Hammarström A. Health status and health behaviour as predictors of the occurrence of unemployment and prolonged unemployment. *Public Health* 2013;127:46–52.

8 Prochaska JJ, Shi Y, Rogers A. Tobacco use among the job-seeking unemployed in California. *Prev Med* 2013;56:329–32.

9 Freyer-Adam J, Gaertner B, Tobschall S, John U. Health risk factors and self-rated health among job-seekers. *BMC Public Health* 2011;11:659.

10 Arria AM, Garnier-Dykstra LM, Cook ET, et al. Drug use patterns in young adulthood and post-college employment. *Drug Alcohol Depen* 2013;127:23–30.

11 Reine I, Novo M, Hammarström A. Does the association between ill health and un-employment differ between young people and adults? Results from a 14-year follow-up study with a focus on psychological health and smoking. *Public Health* 2004;118:337–45.

12 Henkel D. Unemployment and substance use: a review of the literature (1990–2010). *Curr Drug Abuse Rev* 2011;4:4–27.

13 van Zon SK, Reijneveld SA, de Leon CF, Bültmann U. The impact of low education and poor health on unemployment varies by work life stage. *Int J Public Health* 2017;62:997–1006.

14 Crutchfield RD, Gove WR. Determinants of drug use: a test of the coping hypothesis. *Soc Sci Med* 1984;18:503–9.

15 Bartley M. Unemployment and ill health: understanding the relationship. *J Epidemiol Commun Health* 1994;48:333–7.

16 Jusot F, Khlat M, Rochereau T, Serme C. Job loss from poor health, smoking and obesity: a national prospective survey in France. *J Epidemiol Commun Health* 2008;62:332–7.

17 Prochaska JJ, Michalek AK, Brown-Johnson C, et al. Likelihood of unemployed smokers vs nonsmokers attaining reemployment in a one-year observational study. *JAMA Intern Med* 2016;176:662–70.

18 Minkkinen J, Lindfors P, Kinnunen JM, et al. Health as a predictor of students' academic achievement: a 3-Level longitudinal study of Finnish adolescents. *J Sch Health* 2017;87:902–10.

19 Kinnunen JM, Lindfors P, Rimpelä AH, et al. Academic well-being and smoking among 14- to 17-year-old schoolchildren in six European cities. *J Adolesc* 2016;50:56–64.

20 Koivusilta L, Nupponen H, Rimpelä AH. Adolescent physical activity predicts high education and socio-economic position in adulthood. *Eur J Public Health*. 2012;22:203–9.

21 Coall DA, Hertwig R. Grandparental investment: past, present, and future. *Behav Brain Sci* 2010;33:1–9.

22 Lander F, Rasmussen K, Mortensen JT. Social inequalities in childhood are predictors of unemployment in early adulthood. *Dan Med J* 2012;59:A4394.

23 Schuring M, Robroek SJ, Otten FW, et al. The effect of ill health and socioeconomic status on labor force exit and re-employment: a prospective study with ten years follow-up in The Netherlands. *Scand J Work Environ Health* 2013;39:134–43.

24 Robroek SJ, Schuring M, Croezen S, et al. Poor health, unhealthy behaviors, and unfavorable work characteristics influence pathways of exit from paid employment among older workers in Europe: a four year follow-up study. *Scand J Work Environ Health* 2013;39:125–33.

25 Vauhkonen T, Kallio J, Kauppinen TM, Erola J. Intergenerational accumulation of social disadvantages across generations in young adulthood. *Res Soc Strat Mobil* 2017;48:42–52.

26 Koivusilta L, West P, Saaristo V, et al. From childhood socio-economic position to adult educational level - Do health behaviours in adolescence matter? A longitudinal study. *BMC Public Health* 2013;13:711.

27 Geurts T, Van Tilburg T, Poortman AR, Dykstra PA. Child care by grandparents: changes between 1992 and 2006. *Ageing Soc* 2015;35:1318–34.

28 Mare RD. A multigenerational view of inequality. *Demography* 2011;48:1–23.

29 Statistics Finland. 2016. Available at: (26 April 2017, date last accessed)

30 Muthén B, Muthén L. *Mplus User's Guide*. Los Angeles, CA: Muthén & Muthén, 1998–2010.

31 Berlin KS, Williams NA, Parra GR. An introduction to latent variable mixture modeling (part 1): cross sectional latent class and latent profile analyses. *J Pediatr Psychol* 2014;39:174–87.

32 Nylund KL, Asparouhov T, Muthén BO. Deciding on the number of classes in latent class analysis and growth mixture modeling: a Monte Carlo simulation study. *Struct Equ Modeling* 2007;14:535–69.

33 Mackenbach JP. Persistence of social inequalities in modern welfare states: explanation of a paradox. *Scan J Public Health* 2017;45:113–20.

34 Hällsten M, Edling C, Rydgren J. Social capital, friendship networks, and youth unemployment. *Soc Sci Res* 2017;61:234–50.

35 Haapakorva P, Ristikari T, Gissler M. The impact of parental employment trajectories on children's early adult education and employment trajectories in the Finnish Birth Cohort 1987. *Longit Life Course Stud* 2017;8:342–64.

36 Paananen R, Ristikari T, Merikukka M, et al. Children's and youth's well-being in light of The 1987 Finnish Birth Cohort-study. *Report 52,* 2012.

37 Davis-Kean PE. The influence of parent education and family income on child achievement: the indirect role of parental expectations and the home environment. *J Fam Psychol* 2005;19:294.

38 Schuring M, Burdorf L, Kunst A, Mackenbach J. The effects of ill health on entering and maintaining paid employment: evidence in European countries. *J Epidemiol Commun Health* 2007;61:597–604.