The short-term consequences of unemployment among young people have been well documented in literature with regard to psychological ill health, somatic ill health, alcohol consumption, and smoking. However, one of the crucial questions in unemployment research is whether unemployment has only a short-term effect, or if there also is an effect many years after the unemployment has come to an end. This question has a special interest within youth unemployment as work and working life is said to have a fundamental importance for the socialisation of young men and women.

Only a few longitudinal studies have investigated the problem of long-term effects of unemployment. In most cases a relatively short period of unemployment at the beginning of a long observation period has been the basis for classifying a person as unemployed or not unemployed. This makes the long observation period has been the basis for classifying a relatively short period of unemployment at the beginning of a cohort study. This has a special interest within youth unemployment as work and working life is said to have a fundamental importance for the socialisation of young men and women.

Early unemployment can contribute to adult health problems. Thus, youth unemployment constitutes a significant public health problem, which to a certain extent remains in adult age.

**METHOD**

In a prospective cohort study all 1083 school leavers from compulsory school in an industrialised town in the north of Sweden were followed up for 14 years. The cohort of school leavers were 16 years at the beginning of the study and were followed up independently of their activity after compulsory school (future studies, work, etc) until the age of 30. The attrition rate was extremely low. Of the original 1083 pupils in the sample, 1080 were reached in the first survey and 1068 (98.6% of the original sample) participated in at least two of the surveys—1044 participants (96%) complete data from all four surveys are available (547 men and 497 women). Health behaviour and symptom complaints were monitored from the last year in compulsory school in 1981, when the pupils were 16 years old, to the age of 30 (in 1995).

**Data collection**

Data were collected by group questionnaires—at age 16 and 18 during school hours and at age 21 and 30 the participants were invited to reunions with their former classmates. Those who could not attend these reunions (and those at age 18 who had finished school) received a mailed questionnaire. Personal or telephone interviews were performed with participants who did not fill in the questionnaire (because of reading and writing difficulties, etc), in which the interviewer read the questions and response categories exactly as written in the mailed questionnaire.

The measures used in this study of somatic and psychological health as well as of health behaviour have been validated in previous research.

The questions in focus in this study (smoking, alcohol, somatic and psychological health, and unemployment) have had the same wording throughout the whole period studied.

**Unemployment measures**

The data on the length of unemployment were taken from a specially constructed battery of questions where the participants were asked to report how many months and weeks they
were unemployed, employed, studying, or participating in labour market programmes since the last follow up.

In the results section we were contrasting three types of employment patterns, defined in the following way:

- **Early unemployment**: >0.5 years in total of unemployment between the ages of 16 and 21, irrespective of later unemployment.
- **Late unemployment**: >1.5 years in total of unemployment between the ages of 22 and 30 with unemployment <0.5 years between the ages of 16 and 21
- **Reference group**: Not included in any of the unemployment groups above—that is, <0.5 years of unemployment between the ages of 16 and 21 and <1.5 years of unemployment between the ages of 22 and 30.

During the study period, unemployment was actively combated in Sweden with extensive labour market programmes for especially young people with the goal that nobody should be continuously unemployed for more than a certain period (six months for young people and one year for adults). Therefore, we defined unemployment in our study from the summarised unemployment experience. For the early unemployment group, we used a common definition of long term unemployment (six months).

**Smoking**

Smoking was defined as current daily smoking according to the questionnaire. Those who never had smoked, had smoked occasionally or had stopped smoking early were considered as non-smokers.

**Alcohol consumption**

The amount of alcohol consumed was estimated as per annum consumption with the help of a frequency-quantity form. The volume of different alcoholic beverages was converted into decilitres of pure alcohol. Those with alcohol consumption above the 75th centile were considered as high alcohol consumers. Different cut off points have been used for men and women because of large differences in total amount of alcohol consumption.

**Somatic symptoms**

A composite index of somatic complaints was constructed, consisting of 17 different somatic symptoms on a three grade scale—from 0 (no problems) to 2 (serious problems). The questions dealt with current symptoms during the past 12 months: headache, weight problems, gastric complaints, problems with locomotive apparatus, infections, accidental injuries, allergies, etc. All items are shown in the appendix. The summarised index, with a theoretical range from 0 to 34 was dichotomised at the 75th centile and the proportion over that cut off point has been presented as those with psychological symptoms.

### Psychological symptoms

In a similar manner a composite index of psychological symptoms was constructed, consisting of nervous and depressive symptoms on a four grade scale—from 0 (never) to 3 (constantly). The nervous component of the psychological index consisted of five items about restlessness, lack of concentration, worries, palpitation, and anxiety, and their frequency during the past 12 months. The depressive component of the psychological index consisted of two questions regarding depression and sleeping problems (see appendix). This index (range 0 to 21) was also dichotomised at the 75th centile and the proportion over that cut off point has been presented as those with psychological symptoms.

**Working class background**

On the basis of the baseline questionnaire at age 16 the participants were ascribed to working class background if their fathers were blue collar workers or, if they lived with their mothers only, their mothers were blue collar workers. Otherwise they were classified as not having a working class background.

**Long term effects**

To analyse the possible long term effects of early unemployment we have used the inherent quality of the longitudinality in our study to illustrate the difference between the two contrasting explanatory concepts—“selection” and “exposure”. “Selection” is the phenomenon that a group, already at the start of the study and before any unemployment could be possible, shows a higher value of the studied characteristics than the reference group. Unfavourable health behaviour at the end of the study could thus be explained by the fact that the person already showed this unfavourable health behaviour (for example, smoking) at the start of the study. “Exposure” points to the fact that the unfavourable health behaviour is the consequence of exposure to unemployment, either already during the first part of the study (aged 16–21) or only during the second part (aged 22–30). Possible exposure and selection effects are illustrated both in the graphs and in the logistic regression analyses.

**Statistical methods**

The frequency of the different health habits and symptoms were graphically described for the different employment groups. The χ² for trend (Mantel extension) was used to test for linear correlation. The effects of selection and exposure were estimated with logistic regression technique. A p value <0.05 for test for trend and a confidence interval of 95% for odds ratio were chosen to be statistically significant.

The study was approved by the Research Ethics Committees at Uppsala and Umeå Universities.

### RESULTS

**Unemployment in the different unemployment groups**

Table 1 shows the number of persons in each of the unemployment groups and their mean annual unemployment

**Table 1** Number of persons and mean unemployment (mean=weeks per year, SD=standard deviation) for persons in the different employment groups

<table>
<thead>
<tr>
<th>Employment group</th>
<th>Number of persons</th>
<th>Mean unemployment in weeks per year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Early</td>
<td>70</td>
<td>12.8</td>
</tr>
<tr>
<td>Late</td>
<td>111</td>
<td>20.3</td>
</tr>
<tr>
<td>Reference</td>
<td>366</td>
<td>66.9</td>
</tr>
</tbody>
</table>

- **Psychological symptoms**: A composite index of psychological symptoms was constructed, consisting of nervous and depressive symptoms on a four grade scale—from 0 (never) to 3 (constantly). The nervous component of the psychological index consisted of five items about restlessness, lack of concentration, worries, palpitation, and anxiety, and their frequency during the past 12 months. The depressive component of the psychological index consisted of two questions regarding depression and sleeping problems (see appendix). This index (range 0 to 21) was also dichotomised at the 75th centile and the proportion over that cut off point has been presented as those with psychological symptoms.

- **Working class background**: On the basis of the baseline questionnaire at age 16 the participants were ascribed to working class background if their fathers were blue collar workers or, if they lived with their mothers only, their mothers were blue collar workers. Otherwise they were classified as not having a working class background.

- **Long term effects**: To analyse the possible long term effects of early unemployment we have used the inherent quality of the longitudinality in our study to illustrate the difference between the two contrasting explanatory concepts—“selection” and “exposure”. “Selection” is the phenomenon that a group, already at the start of the study and before any unemployment could be possible, shows a higher value of the studied characteristics than the reference group. Unfavourable health behaviour at the end of the study could thus be explained by the fact that the person already showed this unfavourable health behaviour (for example, smoking) at the start of the study. “Exposure” points to the fact that the unfavourable health behaviour is the consequence of exposure to unemployment, either already during the first part of the study (aged 16–21) or only during the second part (aged 22–30). Possible exposure and selection effects are illustrated both in the graphs and in the logistic regression analyses.

- **Statistical methods**: The frequency of the different health habits and symptoms were graphically described for the different employment groups. The χ² for trend (Mantel extension) was used to test for linear correlation. The effects of selection and exposure were estimated with logistic regression technique. A p value <0.05 for test for trend and a confidence interval of 95% for odds ratio were chosen to be statistically significant.

The study was approved by the Research Ethics Committees at Uppsala and Umeå Universities.
at age 16–21 (the early unemployment period) and at age 22–30 (the late unemployment period).

The group with early unemployment showed a 10-fold higher unemployment level during the first period (age 16–21) compared with both the late unemployment (age 22–30) and the reference group. Even in the second period they had a higher level than the references. The group with late unemployment showed much higher unemployment in the late period. The differences between the sexes were small with the exception of unemployment when aged 22–30 in the early unemployed group; here the men had higher unemployment than during the period 16–21 years of age.

Long term changes

One way of illustrating the findings is to show the development of habits and symptoms over time in the three different unemployment groups (fig 1).

The figure underscores that—with one exception—the early unemployed group always had the top position in unfavourable habits and symptoms, but it also draws attention to the fact that already at the outset of the study this early unemployed group was “worse off” regarding the outcome variables. The only significant linear changes in this suite of figures among the two unemployment groups (according to χ² test for trend) was the increase in smoking among early unemployed men and the increase in excess alcohol consumption and somatic symptoms among late unemployed women. Besides, the reference group showed significant increases regarding excess alcohol (men), somatic symptoms (women), and psychological symptoms (men).

Long term effects

To analyse the change in habits and patterns in a multivariate model a logistic regression analysis was performed (table 2).
The model incorporated early and late unemployment and selection—that is, the values regarding symptoms and habits for each of the tested outcomes at age 30; excess alcohol consumption at age 21 tested against excess alcohol consumption at age 30, etc. Adjustment made for all variables in the table. The 95% confidence intervals (95% CI) are given.

### Table 2  Odds ratios (OR) for daily smoking, high alcohol consumption, psychological, and somatic symptoms at age 30 for early and late unemployment, working class background as well as selective factors (daily smoking at age 16 tested against daily smoking at 30; excess alcohol consumption at age 21 tested against excess alcohol consumption at age 30, etc). Adjustment made for all variables in the table. The 95% confidence intervals (95% CI) are given.

<table>
<thead>
<tr>
<th></th>
<th>Daily smoking</th>
<th>Excess alcohol consumption</th>
<th>Psychological symptoms</th>
<th>Somatic symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td></td>
<td>OR 95% CI</td>
<td>OR 95% CI</td>
<td>OR 95% CI</td>
<td>OR 95% CI</td>
</tr>
<tr>
<td>Early unemployment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>2.4</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>3.5</td>
<td>2.0 to 6.2</td>
<td>0.9 to 2.9</td>
<td></td>
</tr>
<tr>
<td>Late unemployment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>1.1</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.7</td>
<td>1.0 to 2.8</td>
<td>0.7 to 1.8</td>
<td></td>
</tr>
<tr>
<td>Selection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>6.3</td>
<td>4.0 to 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.3</td>
<td>4.0 to 10</td>
<td>3.8 to 8.9</td>
<td></td>
</tr>
<tr>
<td>Working class background</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>1.0</td>
<td>0.7 to 1.6</td>
<td></td>
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<tr>
<td></td>
<td>1.0</td>
<td>0.7 to 1.6</td>
<td>0.5 to 1.1</td>
<td></td>
</tr>
</tbody>
</table>

**Key points**

- Already at the beginning of the study those who later become early unemployed had the most unfavourable habits.
- The best predictor of unfavourable health behaviour at age 30 was health behaviour at age 16.
- Even after controlling for possible confounders, including the initial health situation, early unemployment was significantly associated with unfavourable health behaviour and symptoms at age 30.
- Unemployed tend to stay in "permanent impermanence", shifting between labour market programmes, studies, and permanent unemployment.
- The model incorporated early and late unemployment and selection—that is, the values regarding symptoms and habits at the beginning of the study (age 16) on individual level. Besides, working class affiliation among parents was used as a background social indicator.
unemployed people tend to stay in so called “permanent imper-
manence”, a situation that is characterised by shifting between
different labour market programmes, studies, unemployment,
and temporary jobs. This situation, together with the increase of
flexible employment (which means flexible in relation to wage,
job security, working time, etc) on the new labour market
increases the risk for similar negative health effects among the
employed as among the unemployed.29–24 Furthermore, a major-
ity of the cohort continued to secondary high school, which
decreased their time of exposure to unemployment. As the time
period was longer in the late unemployment group the limits
were increased to 1.3 years.

The early unemployed group was defined irrespective of later
unemployment. As a consequence of that the early unemployed
group showed a higher degree of unemployment compared
with the reference group also in the age 22–30 years. Thus,
the long term effects in the early unemployed group could therefore
also be the result of late unemployment. However, other studies
have shown a high degree of correlation between unemploy-
ment at two different time periods and a well documented effect
of unemployment is future unemployment.29 To construct a
construct a group with only early unemployment would be to construct an
artefact with no correspondence in real life. In the logistic
regression analyses it was possible to adjust for late unemploy-
ment and in that way we tried to show the separate effect of
early unemployment. Even though there was a correlation
between early and late unemployment (r<0.2), it was not big
enough to introduce a problem of multicollinearity.

The cut off points for the dependent variables were chosen in
two ways. For smoking we just differentiated between daily
smoking or not. Regarding alcohol consumption there are
some critical levels indicating harmful consumption,30 but
they are not applicable to young persons (as in this case 16
years of age). There was also no natural cut off point regarding
the used scales for symptoms. We decided to arbitrarily use the
75th centile as a cut off point for all these measures.

On results

The study showed that unemployment in young age had long
term effects on health and health behaviour among adult men
and women. Even after control for health behaviour and
symptoms as well as working class background at the begin-
ning of the study and unemployment at the end of the study,
the associations remained between early unemployment on
one hand and smoking as well as psychological and
somatic symptoms on the other hand at the age of 30.

Our results are well in accordance with the few studies
within the field, for example a Swedish long term follow up
study which shows that unemployment, even when controlled
within the field, for example a Swedish long term follow up
(some only) symptoms on the other hand at the age of 30.

The highest frequencies of smokers are found
among short-term educated, and among them the risk of
unemployment is also highest. Other studies, performed on
adults with retrospective data on smoking habits, confirm our
results that those who smoke have the highest risk of becom-
ing unemployed even after control was made for the length of
education and different socioeconomic variables.31

The relation between unemployment and health

The relation between exposure and outcome in a long term
follow up is always cumbersome. Besides confounding factors
there are a number of different ways in which unemployment
may affect health. By adjusting for the entrance value of the
different outcome measures (or to put it another way: by
looking at the individual differences in behaviour and
symptoms between the end and the beginning of the study
instead of just looking at the behaviour at the end of the
study) we can avoid the most obvious selection bias. Even
when adjustment is made for selection, a number of
significant associations persist, indicating that unemployment
may affect health.

Regarding confounding factors, a problem is that many of
the traditional indicators of social background are closely cor-
related with unemployment, not only as confounders but also
as mediators. Short-term education for example, will increase
the risk of unemployment. Adjusting for variables, which are
parts of the causal chain, could lead to an underestimation of
the possible effects of unemployment on the outcome.

We used working class background as a proxy for the social
background situation, which also correlated with study moti-
vation and unemployment experience in the family.32 It turned

Policy implications

- Creation of work opportunities for young men and women should be given a very high priority on the public health agenda.
- Work provides not only occupation but has also an important health promoting function in the transition from adolescence to adulthood.
- The unfavourable combination of hazardous health behaviour and early unemployment should be a challenge for the school: tobacco and alcohol consumption is shaped during the school years and the motivation for future studies is also founded during this period.

More similarities than differences between the men and the
women. Even though smoking habits and psychological
symptoms were more common among girls at the beginning
of the study, the odds ratio for selection was in principle ident-
ical for the two sexes.

The possibilities of other explanations than early unemploy-
ment could never be ruled out. The early unemployment group
was to a much higher degree negatively selected than the late
unemployment group. Thus, early unemployment could be
caused by a socially disadvantaged situation as a child, which
also caused the poorer health situation at age 30. However,
the regression analysis speaks against the importance of an un-
favourable social background when looking at long term
health effects of unemployment. The regression analysis also
speaks for an effect of early unemployment by its own, even
after control for selection.

Our study gave support to both selective explanations as
well as causal theories. Both daily smoking and high alcohol
consumption and to a lesser degree also psychological and
somatic symptoms were highly indicative of future unemploy-
ment. It seems strange that smoking at the age of 16 can be
such a powerful predictor for future unemployment. It is hard
to imagine that the employer's willingness to hire a person
depends to such a high degree on whether or not he or she is
a smoker. The correlation is probably attributable in part to the
connections between smoking habits and education and/or
other variables.32 The highest frequencies of smokers are found
among short-term educated, and among them the risk of
unemployment is also highest. Other studies, performed on
adults with retrospective data on smoking habits, confirm our
results that those who smoke have the highest risk of becom-
ing unemployed even after control was made for the length of
education and different socioeconomic variables.31

The reasons for these longstanding associations remain
unknown and require further studies. In some way or other,
early unemployment seems to affect health behaviour and life
circumstances in a way that makes the direct negative effects
of early unemployment—which are well known from earlier
research—become permanent in adult age even when the
people are no longer unemployed. One explanation could be
that in a situation of unemployment in young age it is difficult
to make a positive reorientation (to stop smoking or to change
cognitive stress related patterns). Health habits seem to be
established in young age and may be difficult to change.32
However, early unemployment had no long term effect on
excess consumption of alcohol despite earlier findings of cor-
relations between unemployment and alcohol consumption in
a short-term perspective.1 A possible explanation could be that
smoking is more addictive and less sensitive for later changes
than alcohol consumption.

Early unemployment had somewhat more negative long
term effects on men. However, overall our results show much

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out that even if this variable is an important confounder in short-term follow up studies, it did not significantly affect the long term results. As the definition of unemployment in this study was rather wide, it included a fairly broad population. This means that our results regarding early unemployment refer to something that will affect a proportionally large group in the community—between 10% and 15%. Thus, our study shows that early unemployment will not only affect the health of young people but can also have far reaching health consequences in adult age.

APPENDIX

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes, slight problems</th>
<th>Yes, serious problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache, migraine</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Common cold, influenza</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cough</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Genital discomfort</td>
<td>0</td>
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<td>2</td>
</tr>
<tr>
<td>Gastritis, heartburn or gastric ulcer</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Indisposition</td>
<td>0</td>
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</tr>
<tr>
<td>Loss of weight</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Diarrhoea</td>
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<td>2</td>
</tr>
<tr>
<td>Constipation</td>
<td>0</td>
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<td>2</td>
</tr>
<tr>
<td>Lack of appetite</td>
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<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Overweight</td>
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</tr>
<tr>
<td>Pains in shoulders</td>
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<tr>
<td>Pains hands, elbows, legs or knees</td>
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<td>2</td>
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<tr>
<td>Backache, pains in hip or sciatica</td>
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<td>2</td>
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<tr>
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<td>2</td>
</tr>
<tr>
<td>Injury</td>
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<td>2</td>
</tr>
<tr>
<td>Breathlessness</td>
<td>0</td>
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<td>2</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Now and then</th>
<th>Relatively often</th>
<th>Constantly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restlessness</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Concentration difficulties</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Anxiety</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Worries</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Palpitation of the heart</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Sleeping problems</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Depression</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Conclusion

Even after controlling for initial health behaviour and symptoms as well as working class background and late unemployment, early unemployment among young men and women showed a significant explanatory effect on smoking, psychological symptoms, and—among men only—somatic symptoms after a follow up of 14 years. No correlation was found between early unemployment and excess alcohol consumption. Thus, youth unemployment constitutes a significant public health problem, which to a certain extent remains to adult age.

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