From Young to Adult:

Health Consequences of Unemployment from a Gender Perspective

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My initial research interest in unemployment issues was devoted to youth unemployment, when I wrote a review on literature and theories in the framework of my Master’s thesis in Public Health (Reine, 2001). The work on the present doctoral thesis started after the turn of the century when Sweden experienced economic stability and welfare. During the final stage of writing my thesis I was witness to a sudden economic fall in the global economy, which affected many countries. Also, Sweden experienced major falls in stock markets, extensive downsizing in various sectors especially industry, and consequently increasing unemployment.

The longitudinal study which provided the database for my thesis was carried out in Luleå - a medium-sized industrial town in the north of Sweden. The project was initiated in 1981 by my main supervisor, Anne Hammarström, who was also the project leader actively collecting data and carrying out the interviews in all phases of the follow-up. My involvement in the project started when the data collection was already completed, and several doctoral dissertations have been defended on this material. Considering the huge research possibilities this database offered, it was, however, not difficult to identify unanswered questions that fitted my own interests as well as complied with the prioritised aims of the Swedish public health policy (2001).

I tried different methodological approaches in order to be able to answer the research questions. Despite the various tested unemployment and health-related measurements, however, I strengthened my knowledge about the general harmful nature of unemployment, not least in relation to several common explanatory factors. And, more importantly, each of the papers written in this thesis gave me more confidence and more knowledge within the field. However, the prominent article by Macintyre et al (Macintyre, McKay, Der, & Hiscock, 2004) with the truthful title “…what you observe depends on how you measure it” might well be in place to relate to my research.

Finally, having academic education in two fields – psychology and public health, adding gender perspective was a great challenge and I learned alot during my time as a doctoral student. It is still way to go to develop gender research; however it is no longer thinkable for me to engage in any kind of future research without having gender perspective.
List of Abbreviations

LTU long-term unemployed
NLTU not long-term unemployed
ALMP in active labour market programmes
UNALMP unemployed, no labour market programmes
PSM propensity score matching
WIS Work Involvement Scale
Abstract

**Background** The point of departure in this thesis is that unemployment is a recognised determinant of health, which may vary between different ages and among men and women. Despite governmental policies to tackle unemployment and ease its effects on health, unemployment continues to be a growing public health problem.

**Aim** The objective of the thesis was to analyse, from a gender perspective, the relationships between ill health and unemployment as well as other unstable labour market positions in the transition from youth to adulthood. The aim of each paper was:

I. Does the association between ill health and unemployment differ between young people and adults?

II. Is the transition from an unstable labour market position to permanent paid job health protective?

III. Is participation in labour market programmes related to mental health?

IV. What is the association between ill health among men and women and how could it be analysed with a gender relations theory?

**Methods** The longitudinal study was carried out in Luleå - a medium-sized industrial town in the Northern Sweden. The cohort, consisting of all 1083 pupils (506 girls and 577 boys) aged 16 who attended the last year of compulsory school in 1981, was followed up at the ages of 16, 18, 21 and 30. The response rates were high e.g. 96.4% at 14 years follow-up. The cohort was followed with extensive and well-validated questionnaires. Multivariate logistic regression was used in all papers, while propensity score matching was used in Paper III.

**Results**

Paper I. Health effects of long-term unemployment differed between young people and adults. Long-term unemployment was more related to psychological ill health and smoking in young people than in adults.

Paper II. The results indicated that after controlling for gender as well as for an indicator of health-related selection, possible confounders and mediators transition from an unstable labour market position to permanent employment could be health-promoting.
Paper III. No association was found between participation in active labour market programmes and psychological symptoms. Due to methodological shortages the results have to be interpreted with caution. Adjustment for either all background selection variables or the propensity score in multivariate logistic regression showed similar associations suggesting that propensity score could be used to adjust for background selection variables.

Paper IV. A strong association between unemployment and suboptimal self-rated health among women and high alcohol consumption among men was found and a theory of structural relations was used to discuss the gendered patterns for ill health.

**Conclusion** The thesis indicated gendered patterns of relations between unemployment and the health outcomes, in the transition from youth to adulthood. The policy implications of my thesis are that full employment policies should be promoted to reduce the health inequalities associated with unemployment.

Keywords: unemployment, reemployment, unstable labour market position, active labour market measures, psychological health, smoking, alcohol consumption, self-rated health, gender, age
The thesis is based on the following papers, which are referred to in the text by their Roman numerals:


III. Reine I, Novo, M, Hammarström. A. Is participation in labour market programmes related to mental health? Results from a 14-year follow-up of the Northern Swedish Cohort. (submitted)

IV. Reine I, Novo, M, Hammarström. A. Unemployment and ill health – a gender analysis. Results from a 14-year follow-up of the Northern Swedish Cohort. (manuscript)
Introduction

The work presented in this thesis addresses the associations between unemployment and ill health in the transition from youth into adulthood, and provides interpretations from a gender perspective by using gender theories. Also, other unstable market positions than unemployment, like being in labour market programmes, occasional jobs, etc., were studied in relation to ill health using a multidisciplinary approach that included unemployment and labour market research, public health, epidemiology, gender research, and health psychology. Understanding the importance of gender relations within the unemployment situation and its influence on health outcomes could provide crucial information for health promotion as well as for public health research. However, it is important to mention that the theoretical framework, especially as regards to unemployment and gender theories, has different levels. Unemployment theories are generally derived from empirical studies, and they rest on the traditional and well-established, although criticised, positivistic research paradigms. Gender theories, on the other hand, criticize traditional research epistemology, are subject to a rapid change and are less rooted in empirical research. Thus, the unemployment theories constitute the main conceptual theoretical framework, which is supplemented by explanations provided by the relational theory of gender.
Background

Public health framework

This thesis lies within the public health science, with focus on structural determinants of health as well as with a population perspective. According to the definition, public health is “a collective action for sustained population-wide health improvement” (Beaglehole, Bonita, Horton, Adams, & McKee, 2004). In Sweden, public health is referred to an interdisciplinary field that studies the environment, working life, health care system and living habits important for population health among men and women, and within social groups (Folkhälsgruppen, 1989). Internal factors (biological, psychological, physical, etc.) and external factors (e.g. social structure, working life, environment, and health care system) may all have an impact on population health, and are called determinants (Högskoleverket, 2007). Measures of public health can both be aimed at creating favourable conditions for social and physical environment and target individuals and groups to raise awareness to the relationship between living habits and health. Public health science also entails studying health care efficiency as well as different health policies for their impact and public health work, impact on society and the different population groups.

One of the important goals of the Swedish public health policy is reduction of health inequalities. Labour market position is not only a key determinant of health, it is also a source of health inequalities (Arber, 1996). In addition, WHO Commission of Social Determinants of Health has emphasized the importance of unemployment and social exclusion for health inequalities (CSDH, 2008) having the main focus on patterns of social stratification and differential exposure to health risks (Baum, 2008). Systematic reviews from developed countries from 2000-2007 on social determinants on health and health inequalities have identified employment and welfare domain, among others, as crucial determinants of health, however, policies regarding some areas, e.g. long term unemployed and young people, still require further research (Bambra, Gibson, Sowden, Wrigth, Whitehead, & Petticrew, 2009). It has also been demonstrated that attempts to implement gender perspective in public health research are insufficient both as regards to analysing inequalities in health as well as providing gender-theoretical explanations for ill health patterns among men and women (Hammarström, 2002).
Concepts of work, unemployment and labour market programmes

Work provides not only the possibility for earning a living but also full participation in the social, economical and political life of the country. A common definition of work is that it is a state or condition of engaging in remunerative work (see e.g. Novo, 2000). Though this definition was assumed to be sufficient in the nineteenth century, nowadays it does not describe all the properties of the work, like physical and intellectual work, productive or purposeful work, domestic work or care work. Work is an active process and results in a certain outcome, either material or intellectual. Everyone who wants to and can work must have an opportunity to do so based on their own individual circumstances (Regeringskansliet, 2008). Unemployment is a life event in which paid employment is involuntarily taken away from an individual (McKee-Ryan, Song, Wanberg, & Kinicki, 2005). People are usually considered as unemployed when they are not active in paid work, but are looking for jobs and are available for work. Those who are jobless but have no intention to work or are not able to work because of serious physical or mental illness are not considered as unemployed (Fuchs, 2002).

Young people are less skilled and experienced than adults, and are therefore more vulnerable to unemployment. According to the Economic Survey of Sweden (OECD, December 2008), youth unemployment is widespread, and even if it declined from 22.8% of the labour force in 2005 to 19.2% in 2007, unemployment in Sweden among young people reached 25% in the beginning of 2009. Young people are less skilled and experienced than adults, and are therefore more vulnerable to unemployment.

Swedish labour market policy

To explain the rationale for defining the main exposure of my thesis, i.e. unemployment, labour market programmes and other kinds of precarious labour market positions, this section will give a short overview of the goals of the Swedish labour market policy and its investment in assisting those being outside the labour market (Aronsson, Gustafsson, & Dallner, 2002). As stated by the Swedish Ministry of Employment (Regeringskansliet, 2008), the labour market policy has to contribute to a well-functioning labour market, to increase employment and to reduce social exclusion. Labour market policy should also improve the way in which the labour market functions, i.e. permanent raising of employment levels in the long term, effective bringing together those seeking work with those seeking employees, prioritising those who are most detached from the labour market and, finally, ensuring that unemployment insurance works as a readjustment
insurance. The Swedish government has identified certain groups that are given priority when taking further measures aimed at increasing employment. These are the long-term unemployed, those who are on long-term sick-leave, occupationally disabled, the young unemployed, older men and women, and men and women with a foreign background (Regeringskansliet, 2005).

There is unemployment compensation available ensured by the Swedish labour market policy in the event of unemployment, including unemployment benefit and activity support, employment services, labour market policy programmes, the job and development guarantee, new start jobs and the European Social Fund.

There are two main types of unemployment benefits – basic insurance and income loss insurance (Ministry of Employment, 2005). The basic insurance is paid to a person who is not a member of an unemployment fund, or is a member of an unemployment fund but does not satisfy the conditions applicable for the entitlement to an income-related benefit. This benefit is paid at the earliest possible date when the unemployed person reaches the age of 20. The income loss insurance is a benefit paid to a person who has been a member of an unemployment fund for at least twelve months.

The general conditions for entitlement to receive unemployment benefits in Sweden are the following:

a person has to be

1. capable of working and unimpeded from undertaking work on behalf of an employer,
2. prepared to accept an offer of suitable work during periods for which the person has not given notice of an impediment that can be accepted by the unemployment fund,
3. registered as a jobseeker with the public employment office in accordance with the procedure prescribed by the Government or the authority appointed by the Government,
4. participating in the drawing up of an individual action plan in consultation with the public employment office, and, finally,
5. actively seeking suitable work but cannot obtain such work (Ministry of Employment, 2005).

An active labour market policy is assumed to increase the search effectiveness of the long-term unemployed. Labour market policies mainly involve the following institutions: the National Labour Market Board (AMS), municipalities, county councils and education authorities.

The National Labour Market Board carries responsibility for the expansion of labour market policy measures, in particular recruitment
incentives. According to the report of the “Swedish Reform Programme for Growth and Employment” (Regeringskansliet, 2005) additional experience of working life and contacts in the labour market acquired through an employment subsidy have proved to be more important than the length of the subsidy. Besides, interaction between various levels of the education system and the local labour market seemed to be crucial for the early identification of skills requirements. Matching of labour market needs is an important tool for eliminating bottlenecks in the labour market which includes training in areas where a shortage of labour can impede growth (Regeringskansliet, 2005). The ability to meet the needs of the labour market is facilitated by an IT-system in the Public Employment Service. The geographical mobility of labour is another factor to be taken into account, especially in Sweden which is a territorially long country meaning extensive travelling from south to north. Matching on the labour market, however, should be based on the knowledge of the type and level of unemployment. Although there is no intention in the present thesis to partake in deeper analyses of economical context, the several types of unemployment – structural, frictional, classical or real-wage, cyclical or Keynesian, and individual unemployment, as described in the Virtual Economy home page (2002) - may have occurred and influenced young and adults in different ways at particular points of time of the study. Individual unemployment, which according to the definition does not allow people to earn money to meet financial obligations, has been analysed as the main exposure in the thesis, although other kinds of unemployment could be considered, for example, structural and frictional unemployment.

During the 1980s Swedish labour market policy began to target young people to a greater extent. In 1981 special labour market programmes for young people were introduced. New measures for young people such as youth team work and new recruitment grants were introduced in 1984. Since 1984 ordinary labour market policy measures were reserved for those over the age of 20. In the second half of 1980s new measures including introduction places and arrangements for part-time unemployed were offered. Active labour market policies are now being improved with the Job Guarantee for youth, thus shifting the focus onto enhancing job-search coaching in the early phase of youth unemployment (OECD, December 2008). However, there is a problem of dualism in employment protection. The recent extension of the maximum duration of temporary contracts may allow employers to better “try out” young job applicants. Thus, there is a risk of youth being locked into temporary contracts rather than regular employment.
Research on unemployment and ill health

The role of employment as a determinant of health has been well documented in previous research indicating that favourable employment and working conditions impact positively on the health of populations (Lavis, 2002). Research has shown that those who have paid permanent jobs report better well-being than those who are retired, unemployed or working within the home (Kessler, House, & Turner, 1987; Moser, Fox, Jones, & Goldblatt, 1986; Ross & Mirowsky, 1995). Employment increases overall well-being through an elevation in social status, economic independence, as well as social support and recognition from others, all of which have been linked to positive health outcomes such as life satisfaction, high self-esteem, and happiness (Bird & Ross, 1993; Gordo, 2006; Ross & Mirowsky, 1995). Also, as a number of studies have noted, entering paid employment from being unemployed is associated with better health among both men and women (Gordo, 2006; Walters & Charles, 1997). Unemployment, on the contrary, is related to poor health (Arber & Lahelma, 1993; Bartley, 1994; Janlert, 1997; Janlert & Hammarström, 2009; McKee-Ryan, Song, Wanberg et al., 2005).

The relationship between unemployment and health might have two directions. On one hand, reviews of the literature on the relationship between unemployment and health point clearly to the fact that loss of employment has a negative influence on the state of the unemployed and increases the signs of ill health (Bartley, 1994). The negative influence of unemployment on health is seen mainly among long-term unemployed (McKee-Ryan, Song, Wanberg et al., 2005). The range and extent of negative health consequences are various. They depend on socio-demographic, personality, situation and time factors, and on the existing social support systems. For example, research shows that lack of secondary education, unemployment at a young age, long-term unemployment, low social class, having children, financial difficulties are associated with poor health among the unemployed (Fergusson, Horwood, & Woodward, 2001; Hammarström & Janlert, 2002; Laaksonen, Rahkonen, Martikainen, & Lahelma, 2005; Malmberg-Heimonen & Julkunen, 2002).

Another direction of the association between unemployment and health suggests that the healthy individuals are selected into employment while unhealthy have a higher risk of unemployment due to mobility out of employment and lower chance of mobility into employment (Mathers & Schoefield, 1998; van de Mheen, Stronks, Schrijvers, & Mackenbach, 1999). Thus, the relationship between unemployment and ill health exists due to the selection of unhealthy individuals into positions of employment. The level of selection as a factor explaining the relationship between employment and good health (Breslin & Mustard, 2003; Mathers & Schoefield, 1998;
Valkonen & Martikainen, 1995) would result in employed populations having lower morbidity and mortality rates in comparison to the general population (McMichael, 1976).

**Specific measures of health outcomes in relation to unemployment**

Psychological ill health is one of the main health outcomes studied in the present thesis and it has been a common measure in numerous studies on unemployment. A comprehensive meta-analytic study indicated that unemployed persons generally have lower psychological health compared to those employed (McKee-Ryan, Song, Wanberg et al., 2005).

Psychological health is a broad construct with a vast array of scales and measures used in the unemployment literature which includes four specific and distinct components (Diener, Suh, Lucas, & Smith, 1999). Three of these are pleasant affect or positive well-being (e.g. joy, happiness, mental health), life satisfaction (a global evaluation of one’s life), domain or situation satisfaction (e.g. work, family, leisure, health, economical situation, self). The fourth component - unpleasant affect or psychological distress, has been consistently related to unemployment, in particular, guilt, shame (Rantakeisu, Starrin, & Hagquist, 1999), worry, stress, anger, sadness, anxiety and depression (Creed, Muller, & Machin, 2001; Grossi, 1999; Janlert & Hammarström, 2009; Kokko, Pulkkinen, & Puustinen, 2000; Wilson & Walker, 1993).

Early evidence tended to indicate that unemployment may have adverse effects on the psychological health (Eisenberg & Lazarsfeld, 1938; Feather & O’Brien, 1986; Warr & Jackson, 1985). These effects have now been documented in a number of studies that have involved both cross-sectional and longitudinal designs, and the variables that moderate the size of these effects are now better understood. Research also shows that the association between unemployment and psychological ill health points towards two directions, i.e. both selection and exposure might be important in explaining the association between unemployment and psychological ill health (Halvorsen, 1998) but studies on young people indicate that the exposure was stronger than the selection (Hammarström & Janlert, 1997).

Empirical findings about age and psychological health among unemployed are inconsistent (McKee-Ryan, Song, Wanberg et al., 2005). The majority of studies have found associations between unemployment and poor psychological health among adults (Kokko, Pulkkinen, & Puustinen, 2000), especially men (Artazcoz, Benach, Borell, & Cortés, 2004). However, comparative studies on unemployed people of different age groups are few; therefore it is not possible to draw direct conclusions about the strength of unemployment effects among different populations. Nevertheless, there are
a number of studies showing that young unemployed people run a high risk of having psychological ill health. A study from Britain (Banks & Jackson 1982) found that unemployment after school was related to depressed mood. Several later studies showed that more girls suffer from depression, psychological instability and lower self-esteem than boys, if being unemployed (Hagquist & Starrin, 1996; Hammarström & Janlert, 1997). Other findings suggest that being unemployed in a young age may have negative effects on psychological health only among boys (de Goede, 1996). Studies on youth unemployment and health have now become an important part of unemployment research in many welfare states (Bacikova-Sleskova, van Dijk, Madarasova Geckova, Nagyova, Salonna, Reijneveld et al., 2007; Hammarström & Janlert, 2002). Nevertheless, young people are usually treated as a homogenous group that simply differs from adults with little consideration of gender, social class and other sources of heterogeneity.

It was earlier claimed that psychological ill health does not have a linear effect in relation to the length of unemployment (Winefield & Tiggeman, 1990), where psychological distress reaches its peak at the start of the unemployment and then declines to rise again. However, there is no consensus about later peaks in psychological ill health; some researchers claim that one or more years are related to poorest psychological health among adult men (Gordo, 2006), while others state that distress among young people peaks after nine months in unemployment (Winefield & Tiggeman, 1990). With no pronounced gender differences, nervous complaints were found to increase with increasing unemployment length (Hammarström & Janlert, 1997).

Somatic health measures may cover a wide range of subjective and objective assessments of physical well-being (McKee-Ryan, Song, Wanberg et al., 2005). Objective somatic health assessments include mortality and other measurable signs of somatic ill health. The relationship between unemployment and all-cause mortality including suicide is well-established, in for example, a recent EU-wide study (Stuckler, Basu, Suhrcke, Coutts, & McKee, 2009). Unemployed men in most age groups are found to have an increased death risk (Janlert, 1997). A Japanese study showed an association between unemployment and mortality among young, middle-aged and elderly men, and also young women (Yamasaki, Araki, Sakai, Yokoyama, & Voorhees, 2008). Suicide is a cause of death particularly associated with unemployment because unemployment may act as a stressful life event leading to suicide (Lewis & Sloggett, 1998), particularly among young men (Shah & Bhandarkar, 2008). In relation to other objective measures, long-term unemployment has been shown to be related to high blood pressure among adult men (Janlert, 1991) as well as among young men and women (Hammarström, 1994a).
Information on subjective somatic health is usually obtained with inquiries on the type and extent of different symptoms, e.g. gastrointestinal problems, pain, colds, injury, which could be chronic or acute by nature. However, a number of somatic symptoms may overlap with or originate from psychological symptoms, e.g. exhaustion, fatigue, and dizziness. The association between unemployment and stress reactions has been confirmed by several studies both among men and women (Cohen, Kemeny, Zegans, Johnson, Kearney, & Stites, 2007; Grant, Hamer, & Steptoe, 2009). Stress-related illnesses caused by unemployment include cardiovascular disease, musculoskeletal disorders, higher blood pressure, and premature mortality (Arber & Lahelma, 1993; Bartley, 1994; Hammarström, 1994a). Associations between unemployment and subjective poor somatic health have been found among adult men (Claussen, Bjorndal, & Hjort, 1993; Isaksson, Johansson, Bellaagh, & Sjöberg, 2004) and also women (Janlert & Hammarström, 2009). Nevertheless, the relationship between age and physical health has rarely been examined in the unemployment context (McKee-Ryan, Song, Wanberg et al., 2005), more research is needed.

Self-rated health is a widely used health measure. Moreover, poor self-rated health among the unemployed has been identified as an increasing public health problem (Åhs & Westerling, 2005). Lower self-rated health has been found in unemployed women (Giatti, Barreto, & Cesar, 2008), and in some studies in both genders compared to those employed (Kaleta, Makowiec-Dabrowska, & Jegier, 2008; Molarius, Berglund, Eriksson, Lambe, Nordström, Eriksson et al., 2006; Åhs & Westerling, 2005). These studies involve only adult populations.

Self-rated health is a multidimensional concept which incorporates a variety of physical, psychological, emotional and behavioural components and is usually operationalized as a global summary measure of health status indicating a person’s health-related well-being (Manderbacka, 1998). However, health behaviours are found to be relatively unimportant in health self-assessments (Simon, De Boer, Joung, Bosma, & Mackenbach, 2005). Self-rated health is usually measured with one or several simple questions where respondents are asked to indicate their health in general. “How is your health in general?” is a commonly used question. There are several advantages in using this measurement, it is inexpensive and relatively reliable compared to other similar instruments (Martikainen, Aromaa, Heliövaara, Klaukka, Knekt, Maatela et al., 1999) and can be easily translated into different languages without losing the validity as long as it includes an overall rating.

Research suggests that awareness of gender differences is important in discussions of the role of self-rated health (Emmelin, Weinehall, Stegmayr, Dahlgren, Stenlund, & Wall, 2003). The reporting variations show that the way men and women process information for making self-assessments on
health differ, namely that women’s self-ratings are based on a wider range of health-related and non-health-related factors than men’s (Benyamini & Idler, 1999). Men seem to refer to functional aspects more frequently (Simon, De Boer, Joung, Bosma, & Mackenbach, 2005) and, as a Swedish study shows, the assessment by men might have a better ability to predict morbidity and mortality (Emmelin, Weinehall, Stegmayr et al., 2003).

There is inconsistent research about the associations between unemployment and unfavourable health habits. Increased consumption of alcohol and tobacco and poor lifestyle choices involving diet and exercise have been related to unemployment in adult (Ali & Lindström, 2006; Janlert, 1997; van Praag, Bracke, Christiaens, Levecque, & Pattyn, 2009; Virtanen, Vahtera, Broms, Sillanmäki, Kivimäki, & Koskenvuo, 2008) as well as young populations (Hammarström, Janlert, & Winefield, 2002; Kestilä, Martelin, Rahkonen, Joutsenniemi, Pirkola, Poikolainen et al., 2008; Novo, Hammarström, & Janlert, 2000b). As unemployed people suffer from more stress than those employed, the unemployed may find maladaptive ways of coping through unfavourable health behaviour like alcohol use (Courtenay, 2000; San José, van de Mheen, van Oers, Makenbach, & Garretsen, 2000) and smoking (De Vogli & Santinello, 2005). Heavy alcohol consumption has been found to be related to unemployment with a duration of more than six months among young (Hammarström, Janlert, & Winefield, 2002) and adult men (San José, van Oers, van de Mheen, Garretsen, & Mackenbach, 2000), and also among young men, as well as women (Kestilä, Martelin, Rahkonen et al., 2008). In the Northern Swedish cohort a relationship between unemployment and increased alcohol consumption was found, but after controlling for having children, the relationship turned negative among women (Janlert & Hammarström, 1992). Thus, having children was protective for alcohol consumption among young women, but not among young men. The relationship between unemployment and smoking was found to be strong among adult men (De Vogli & Santinello, 2005), and young men and women (Hammarström & Janlert, 1994; Hammarström, Janlert, & Winefield, 2002; Lawrence, Fagan, Backinger, Gibson, & Hartman, 2007). Smoking has been related to unemployment among men and women with an average duration of unemployment between two and three months (Bolton & Rodriguez, 2009). Evidence also shows that even after controlling for health behaviour before the unemployment occurrence, the effect of unemployment on smoking and alcohol consumption remains strong (Hammarström & Janlert, 2002; Montgomery, Cook, Bartley, & Wadsworth, 1998).
Theoretical framework

The theoretical point of departure of my thesis is to synthesise unemployment theories and gender perspective. The theory of gender as a social structure has been used as a conceptual framework in the analysis of the results. I use a definition of gender as defined by Raewyn Connell (Connell, 2006b): “Gender is, above all, a pattern of social relations in which the positions of women and men are defined, the cultural meanings of being a man and a woman are negotiated, and their trajectories through life are mapped out”. Thus, gender is a dynamic system where the categories are not simple or stable; moreover, many gender issues concern patterns of interaction and relationship, and are not a matter of differences in personal characteristics (Connell, 2006a). The concept of sex, which is usually associated with reproductive differences between men and women, was not used in the analyses of my thesis.

The relational theory of gender

The main gender theoretical approach in the present thesis is based on the concept of gender as an analytic category and involves structural analyses of gender relations being claimed to be central in medical gender research (Hammarström, 2007). Raewyn Connell’s gender relational theory is based on an understanding of gender as a structure of social relations, which always involves men and women, and includes different forms of masculinity and femininity (Connell, 2006b). Each society has a gender order in which relations between people are based on biological sex, but even more, on the societal division of privileges and burdens between men and women, where asymmetric relations - domination of men and subordination of women - are created and maintained (Connell, 1996). According to Connell, people claim a place in the gender order or respond to the place one is given by the way they are conducting themselves in everyday life (Connell, 2006b). As an American sociologist Barbara Risman suggests, social structural analyses could help to understand not only how men and women are forced into different social roles but also explain how and why they choose their gendered paths (Risman, 2004). Besides, conceptualising gender as a social structure makes it possible to analyse the ways in which gender is embedded at the individual, interactional, and institutional dimensions of the society.

The multidimensional model of gender relations forms the organisational gender regime which is present in all sectors of society. Connell describes four distinct dimensions of gender relations which I find useful in unemployment research – the power, production, emotional, and symbolic relations. The power dimension of gender relations deals with the power
that tends to be inherent in masculinity and the weakness that is associated with femininity in a given culture. Connell defines the production dimension of gender relations as the recognition that the labour system is divided along gender lines, making certain jobs suitable for men and others for women. The emotional dimension of gender relations concerns itself with the emotions that exist between people as they negotiate the other realms of relations. The symbolic dimension of gender relations examines a society’s overall perception of masculinity and femininity as far as determining what types of masculinities and femininities are prevalent or acceptable. It is in this dimension that western societies and the labour market most closely resemble one another, i.e., masculinity is symbolically associated with jobs that are defined as dirty, physically heavy, or involve heavy machinery or high technology (Connell, 2006a). Repetitive and undemanding jobs and jobs involving children and care work are more associated with femininity.

Feminist scholars (Harding, 1986) have used the gender system theory to explain the patterns of the division of labour. Gender as a symbolic system implies that different, and in principle opposite, characteristics are assigned to men and women (e.g. active/passive, public/private). Gender as a structural system is embedded in fitting the division of labour into the symbolic system. For example, arguments on the biological peculiarities of the two sexes in 1970s and beyond supported the oppression of women by putting them in unpaid labour like childcare and household work (Annandale, 2009). The individual system of gender influenced the formation of the personal identity through collective opinions about what is appropriate for men and women (Harding, 1986). The gender system theory focuses on the dichotomy of gender rather than looks for differences between groups of men and women. Besides, the gender system theory does not consider the multiple relations of gender and lacks the power dimension, if compared to the relational theory.

There is a consensus among feminist researchers that multiple axes of oppression should always be taken into account, and that gender must be understood within the context of the intersecting domains of inequality (Risman, 2004). The concept of intersectionality strives to problematise not only the gender system approach, but also demonstrate how gender system interacts with other power systems such as class, ethnicity and age (Lykke, 2003), which all may have an impact on the labour market. Sociological research indicates that accounting for education, experience, and skill does not fully explain significant differences in labour market outcomes (Browne & Misra, 2003). Although intersectionality might help to understand inequities in health and the implications of the multidimensional impact of gender on social status within society, using intersectional framework as the only analytic solution in analysing the association between unemployment and ill health might be insufficient.
Gender segregation and the labour market

Women have less wealth and property than men almost everywhere in the world, and they tend to have higher burdens of work in the economy of ‘care’ - ensuring the survival, reproduction and security of people, both young and old (Sen, Östlin, & George, 2008). Besides, women are typically employed in lower-paid, less secure, more ‘informal’ contracts than men.

Gender hierarchy governs how people live and understand and accept their lives as being men and women. Even though the Swedish society has been well-known for its efforts in attaining equity for several decades, the Swedish labour market is one of the most gender-segregated, and this segregation is both vertical and horizontal (Gonäs, Plantega, & Rubery, 1999). Women are underrepresented in leading positions both in the state and private sector, which can be described as vertical segregation. This horizontal segregation means that men and women have different tasks through involvement in different jobs. They may also perform different tasks even if they work together, in the same working place and have the same position. The horizontal gender-segregation results in lower wages for women, less control over the work situation, weaker attachment to the working-life and worse possibilities to advancement than men (Kilbom, 2001).

In Sweden, the monthly wage for women was on average 84 per cent of that for men in 2003 (Regeringskansliet, 2005). Since 2004 the difference between men's and women's salaries has decreased slightly. According to Statistics Sweden (2009), allowing for differences in age, level of education, hours worked, sector and occupation between men and women, in 2008 the figure was 92 per cent. The remaining differences mainly reflected the structure of the labour market and discrimination against women.

High unemployment rates hit the men-dominated sectors in the beginning of the 1990s while sectors represented mostly by women were hit by increased unemployment some years later. These changes resulted in increased demands and decreased influence on the work-place as well as threatening unemployment (Gonäš, 1994) which resulted in poorer psychological health, in particular for women in men-dominated sectors.

Gender analyses of unemployment theories

The invisibility and powerlessness of women in the workforce influenced their exclusion from theories as well as from empirical labour market studies. Not surprisingly, theoretical paradigms and theoretical models of unemployment studies were inevitably of a male gender (Feather, 1990;
The importance of studies on solely men were supported in a review on unemployment and health by Wilson and Walker implying that women’s health was less affected by unemployment (Wilson & Walker, 1993). The conclusions of their review were mainly based on studies among male populations and thus involved a serious risk of gender bias. Whatsoever, there is a long history of excluding or making women invisible in medical and social research (Annandale, 2009). A failure to disaggregate research data on the basis of sex is another source of bias (Phillips, 2008), which may arise from assuming the sameness and also equity between men and women when there are genuine differences (Risberg, Johansson, & Hamberg, 2009). Even today, unemployment research gives interpretational preference to men and without sufficient reflection continues to use theories that were inspired by the concept of male as a breadwinner.

Although unemployment research has shifted from studies on exclusively white middle-aged men (Feather, 1990), most of the current studies on unemployment and health are still gender-blind (Hammarström 2007), which includes studies on one sex only or studies that control for sex in the analyses (Cohen, Kemeny, Zegans, Johnson, Kearney, & Stites, 2007; Molarius, Berglund, Eriksson et al., 2006). Also, research is common that analyse differences between men and women (Bacikova-Sleskova, van Dijk, Madarasova Geckova et al., 2007), but these studies often treat gender as a property of an individual rather than a relational, dynamic construct (Kavangh & Bentley, 2008). Critiques have been expressed towards generally little effort in incorporating gender theories in unemployment research (Hammarström, 2007), and thus it could be difficult to compare health experiences and determinants of health for men and women (Annandale & Hunt, 2000).

It has been argued that the association between unemployment and health status deserves further explanations from a gender perspective (Hammarström, 2007; Hammarström & Janlert, 2005). Gender analyses would provide a better understanding of the epidemiology of health problems and have therefore been suggested to be incorporated in future research (Vlasoff & Garcia Moreno, 2002). Besides, a claim for more reflexivity and gender research development in quantitative medical research has been expressed (Hammarström, 1999). The first gender-theoretical review on health consequences of youth unemployment was published in 1994 (Hammarström, 1994b). Although some recent studies have used a gender perspective to explain the associations between unemployment and poor health (Artazcoz, Benach, Borell et al., 2004; Jusot, Khlat, Rochereau, & Sermet, 2009), there is an overall lack of a gender theoretical approach within the field (Hammarström, 2007). Researchers lack an effective common framework for understanding how to incorporate
gender into a social determinant of health model (Kavanagh & Bentley, 2008).

Overall, there is a lack of gender awareness in most of the unemployment theories that originated in the previous century. The development of unemployment research has shifted from mainly economic explanations of psychological ill health to multifaceted analyses of psychosocial factors affecting health and health habits of the unemployed. One of the early unemployment theories - Stage theory - proposed in the 1930s (Eisenberg & Lazarsfeld, 1938), suggested that the unemployment experience was a process involving several destructive stages for psychological well-being. However, this theory has been criticised for being more applicable on mature individuals rather than young people, especially newly graduates (Winefield, Tiggeman, Winefield, & Goldney, 1993). I would also like to point out that the Stage theory ascribed the potential harmful effects of unemployment among men only, who due to job loss suffered from loss of status and prestige (Eisenberg & Lazarsfeld, 1938). Thus, the portrayed macroeconomic problem during the Great Depression actually seems to reflect the exiting sexual division of labour and could be more viewed as a personal disaster for men who were struck by unemployment. A more recent study on the German Socio-Economic Panel (Gordo, 2006) which involved men and women with experience of different length of unemployment discovered that the results were compatible with the predictions made by the Stage model. Although the sequence of different stages (from optimism to pessimism and, finally, fatalism) after losing the job were similar for both genders, men were more psychologically affected by short-term unemployment while long-term unemployment negatively affected both men and women.

Another influential theory on the impact of unemployment on psychological health – Jahoda’s Deprivation theory (Jahoda, 1981), proposed that employment provides not only income (as a manifest function) but also has five latent functions that are psychologically beneficial; it imposes a time structure on the working day, provides social contact, involves people in shared goals, gives one identity and, enforces activity. Although Jahoda’s theory could be used to understand the consequences of unemployment (Hammarström, 1994b), it has been shown in earlier studies, for example in Australia (Winefield, Tiggeman, Winefield et al., 1993), that it was not adequate to explain the deterioration in health among young populations. In question is also Jahoda’s assumption that even bad jobs are beneficial for psychological well-being. We might assume that findings from the 1930s described the real consequences of unemployment during the Great Depression, and having any kind of job was more seen as a chance to be rescued from total poverty. Yet, a recent study in 15 European countries found that precarious employment was related to ill health (Benavides, Benach, Diez-Roux, & Roman, 2000), and as shown by a Swedish study,
being locked in non-preferred job might also affect the health negatively, especially among women (Aronsson & Göransson, 1999).

Although the model of latent functions was shown to have the highest capacity among theoretical models of unemployment to explain the association between unemployment and ill health both among men and women (Janlert & Hammarström, 2009), when applying the Deprivation theory to today’s labour market, manifest and latent functions may have limiting potential to explain the association the association between unemployment and ill health without considering gender relations in society. Fulfilling the fundamental psychological needs may differ among men and women depending on different gendered patterns (Sen, Östlin, & George, 2008). The theory of gender relations (Connell, 2006b) could be useful to explain at least one of the latent functions - the creation of identity among unemployed men and women. The symbolic dimension of gender relations determines which masculinities and femininities are acceptable in the society as well as in an unemployment situation. Work people do form part of their identity or sense of status in the society; but unemployment may impair self-image and make one feel disrespected for being unemployed (Kulik, 2000), especially among men who are expected to construct hegemonic masculinity through entering the labour market arena (Connell, 2001).

Agency theory, which was proposed by Fryer (Fryer, 1986), as an alternative to the criticised Jahoda’s Deprivation theory, focuses on restrictions imposed by economic deprivation of the unemployed by making it difficult or impossible to organise personally satisfying life-styles. Although Australian research suggests that Agency theory helps to explain psychological problems of unemployed youth by activities they involve in (Winefield, Tiggeman, Winefield et al., 1993), personal agency may be limited depending not only on age, but also on gender order in society putting restrictions on the freedom to act in one way or another, particularly among women.

Income itself is a widely accepted determinant of health, and a lack of income was found to correlate with poor health (Raphael 2004, Marmot and Wilkinson 2006). Theories of financial stress mainly explain how unemployment affects health (Thomas, Benzeval, & Stansfeld, 2007; van de Mheen, Stronks, Schrijvers et al., 1999). A number of studies have shown a negative relationship between perceived financial strain and well-being during unemployment (Creed & Macintyre, 2001; Rantakeisu, Starrin, & Hagquist, 1999).

Financial problems related to unemployment are frequently used in theories to explain the relation between unemployment and poor health status. The better financial situation among men than women in our society is rooted in the gendered division of labour (Connell & Messerschmidt,
and could be seen as a dimension of economic power in favour of men (Connell, 2006b). Thus, women receive lower unemployment benefits than men (as men generally receive higher income) and thus women may experience more financial stress than men (Connell & Messerschmidt, 2005). However, unemployed men might suffer more from more financial stress because the construction of masculinity requires access and control over financial resources (Bielenski, 1999; Connell & Messerschmidt, 2005).

The Karasek-Theorell’s control-demand model implies that unemployment can be regarded as a passive situation with low control and low demands (Karasek & Theorell, 1990). The control dimension in this model has been found to be of greatest importance for the health status of the unemployed (Ali & Lindström, 2008). Also, the power dimension of the gender regime suggests that creation of hegemonic masculinity might be impaired among men with low control (Connell, 1996, 2006b). Women on the other hand may suffer more than men from lack of control, due to their overall subordinate position in society. Subordinate status and lack of power among unemployed may reduce the ability to control the working situation both among men and women. Although undemanding situations are symbolically associated with femininity (Connell, 2006a), they might be related to poor psychological health among both unemployed men and women.

Unemployment research has also raised questions about work involvement as a mediating factor. A frequently investigated factor that could influence the consequences of unemployment is work attitudes, commonly measured by the Work Involvement Scale (WIS) (Warr, Cook, & Wall, 1979). The negative influence of high work involvement on health among unemployed was identified by Stafford (Stafford, 1980). He observed that those with an orientation towards work experienced a greater loss of self-confidence during unemployment, although a positive result might also be expected, i.e. high work values could be a strong incentive for someone who is unemployed to find a way out of unemployment (Hammarström, 1988). Long-term unemployment may lead to decreased value in having a job (Nordenmark, 1999; Novo, Hammarström, & Janlert, 2000a; Novo, Hammarström, & Janlert, 2001) and influence the reemployment process negatively. However, it seems as if the explanatory potential of work involvement has decreased during the last decades as a recent study showed that WIS had the smallest explanatory power for ill health among unemployed men and women (Janlert & Hammarström, 2009). According to the traditional view women value non-work higher than men, and as a consequence they enjoy better well-being during unemployment than their male counterparts. However, the increasing level of women’s participation in the labour force and consecutively increasing rates of unemployed women require gender analysis (Isaksson, Johansson, Bellaagh et al., 2004). A
Swedish study of the long-term unemployed reported an interaction between age and gender in regard to work involvement (Nordenmark, 1999). Another Swedish study, however, found no age differences as regards to work involvement, and women seemed to value work as much as men, but they still did not feel that they had the same entitlement to work (Isaksson, Johansson, Bellaagh et al., 2004). These results could be described as a dimension of production (Connell, 2006a), with the labour system being divided along gender lines.

**The Objectives**

The objective of the thesis was to analyse, from a gender perspective, the relationships between ill health and unemployment as well as other unstable labour market positions in the transition from youth to adulthood, as well as to describe associations, to test hypotheses and to assess potential mechanisms.

The more specific research questions were:

1. Does the association between ill health and unemployment differ between young people and adults?
2. Is the transition from an unstable labour market position to permanent paid job health-protective?
3. Is participation in labour market programmes related to mental health?
4. What is the association between unemployment and ill health among men and women?
The Method

The empirical basis for this thesis consists of the Northern Swedish Cohort - a cohort of all people who attended or should have attended the last year of compulsory school in the municipality of Luleå in 1981. A 14-year follow-up study was performed with almost identical questionnaires at several occasions i.e. at ages 18, 21 and 30.

Papers I to IV are all based on quantitative data material from this longitudinal prospective cohort study. Table 1 presents the overview of the material used in the four studies.

The papers in this thesis are analysed by quantitative methods in order to test the associations between the health outcomes and unemployment as well as different unstable labour market positions. The health outcomes studied were psychological symptoms, daily cigarette smoking, high alcohol consumption and suboptimal self-rated health. The analyses included controlling for health-related selection and different confounding factors.

Table 1. Overview of the material used in the four studies.

<table>
<thead>
<tr>
<th>HEALTH OUTCOME MEASURES</th>
<th>STUDY</th>
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<td>Psychological symptoms</td>
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<td>Smoking</td>
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<td>30</td>
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<td>MAIN EXPOSURE</td>
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<td>Unemployment</td>
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<tr>
<td>Unstable labour market position</td>
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<td>Labour market programmes</td>
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Setting

Luleå is the seat of the Norrbotten County Administration and in 2009 had a population of about 73400. In 1981, when the baseline study used in the present thesis was performed, there were approximately 67000 inhabitants. Luleå city, which has an area of 1782 km², was founded in 1621 and was an important commercial centre for maritime trade with ports in the south,
particularly Stockholm. In the 1940s the Norrbotten Ironworks was founded and had an important role for Luleå and the whole of the County of Norrbotten. It is nowadays known as SSAB Luleå (Swedish Steel Co. Ltd, Luleå Steelworks) and is one of the most modern steelworks in Europe. The most important cornerstones of the development of Luleå city are metallurgy, education and research, as well as good communications.

The data of this thesis was collected during two different phases of the business cycle in Sweden. In 1980s Sweden went through a period of high economic activity with low unemployment rates. However, in the beginning of 1980s there was an increase in the inflow into youth unemployment. The rates of unemployment tended to be higher among young people than among adults, and youth unemployment rate in Luleå was double as in Sweden as a whole (Hammarström, Janlert, & Theorell, 1988). According to the statistics from 1981, when the cohort study used in the present thesis started, the relative unemployment rate among young people of age 16-24 years was 6.3%; at the next follow-up in 1983 the rate was 8.0%. In 1986 only 1.6 percent of the total workforce was unemployed, while the unemployment rate among those younger than 25 years was 3.7 percent. There was no gender difference regarding the total unemployment levels.

In the beginning of 1990s Sweden went through dramatic shifts of the trade cycles with rapidly increased unemployment rates. In 1995 when the 14-year follow-up was performed, the total unemployment in Sweden was eight percent – 9.7 percent among men and 6.6 among women. At the same time changes in the organisation of the work occurred – new management strategies, increased demands for flexibility, extended work tasks and cut-off in manpower. During this period of dramatic changes of the labour market the participants of the study went through some of the most socially critical periods in human development: finishing education, establishment in the labour market, family-building, parenthood. Thus, different processes were taking place in this study: the structural changes which occurred in the labour market as well as individual changes associated with human development.

**Population**

The population consists of all 1083 pupils (506 girls and 577 boys) aged 16 who attended or should have attended the last year of compulsory school in Luleå in 1981. Complete data for the whole 14-year follow-up period were collected for 1044 individuals (547 men and 497 women), i.e. 96.4% of the original sample. Extensive work was carried out to reach every participant, including those who had moved, in order to keep the non-response rate to a minimum (Hammarström & Janlert, 2002). Thus, the non-participation rate
in this study, including those who had deceased during the 14 year period, corresponded to 3.6%.

**Procedure**

Data were collected with a comprehensive self-administered questionnaire during school hours (at the age of 16 and 18 years) and during class reunions (at the ages of 21 and 30 years). Questionnaires were sent to those who could not attend these reunions, followed by a reminder if necessary. Participants who failed to reply were contacted by telephone and interviewed, if they agreed to participate. The questionnaires included items on psychological and physical symptoms, health behaviour, experiences of work and unemployment, as well as socio-economic data. The questionnaire contained questions from scales of specific constructs and symptom check lists used in earlier research, e.g. from items related to psychosomatic problems and health habits (Hammarström, 1994b; Hammarström & Janlert, 1997; Johansson, 1970; Lavik, 1976; Novo, Hammarström, & Janlert, 2000). Most of the questions have been validated in previous studies (Hammarström, 1986).

All 9th grade teachers (n=65) in 1981 who coordinated class work, had regular contact with a pupil and taught at least one subject as well as kept a regular contact with the pupil’s parents. The teachers were interviewed by the project leader about each pupil using structural questionnaires regarding pupil’s characteristics, life circumstances and future prognosis (Hammarström, 1986; Sundelin & Vuille, 1975).

**Measures**

In the thesis the following definitions of different forms of labour market attachment were used:

**Exposure**

*Permanent paid work*

In this thesis permanent paid work (Papers II and IV) was defined independent of having part-time or full-time employment. However, there is an ongoing discussion about underemployment (Dooley, 2003) which arises in situation when a person, despite his or her own wish to work longer hours does not have such possibility. In Sweden, a rather large proportion of parents, especially mothers with small children work part-time, therefore in this thesis we treated all permanent employment above 20h/week as a permanent paid work.
Unemployment

Unemployed people are not active in paid work, but are looking for jobs, and are available for work. A distinction should be made between short and long-term unemployment, because shorter periods of unemployment may be welcome as a break from stressful and demanding jobs. However, long-term unemployment has been recognisably associated with health problems (Gordo, 2006; McKee-Ryan, Song, Wanberg et al., 2005; Turner, 1995). However, no consensus has been reached as regards the length of unemployment to be defined as long-term. In the present thesis, we have tested different periods of unemployment, especially in relation to age and time period between the follow-ups.

Labour market programmes

Participants of active labour market programmes (ALMP) were in focus in Paper III. The following main exposure groups were defined:

Age groups 18-21 (young)
ALMP – participants in active labour market programmes, dichotomised at the 75th percentile of the total time in ALMP during the three year period. The cut-off point was 36 weeks;

UNALMP – unemployed and not participating in ALMP, dichotomised at the 75th percentile of the total time in unemployment during the three year period. The cut-off point for young men and women was 12 weeks.

Age groups 22-30 (adults)
ALMP – participants in active labour market programmes, the dichotomisation of the total time in ALMP during the nine year period was performed as close as possible to the 75th percentile (at the 81st percentile), with a cut-off point of 4 weeks;

UNALMP - unemployed and not participating in ALMP, dichotomised at the 75th percentile of the total time in unemployment during the nine year period. The cut-off point was 60 weeks.
Unstable labour market position

As young people often move between different temporary situations such as unemployment, labour market programmes, and precarious employments (Novo, 2000), unstable labour market position was defined in Paper II as being in unemployment, occasional jobs or labour market programmes. The analyses of an unstable labour market position rather than unemployment alone were assumed to give a more comprehensive picture of the transition to permanent employment.

Outcome

Ill health was measured and operationalised in several different ways. Psychological well-being covers a range of interrelated affective, cognitive and behavioural processes. Low psychological well-being is illustrated in anxiety, depression, and lack of self-confidence, low sense of personal autonomy, inability to cope with the problems of living, and dissatisfaction with oneself and the social and physical environment. Low well-being is not identical with psychiatric illness. Illness is primarily about how an individual experiences the disease (Baum, 2008). However, when the features are relatively extreme, generalised and extended in time, low psychological well-being may be reflected in certain forms of illnesses.

Different measures of psychological ill health were used. Papers I-III used a question on nervous symptoms “Have you had nervous problems during the last 12 months?” with an overall answer alternative “no” (=0) or “yes”. For those ticking “yes” it was possible to choose one or several items on restlessness, nervousness, concentration problems, worries, anxiety and palpitations and mark them as yes (=1 for each item). Study I used that question in combination with three other measures about the frequency of sleeping problems, depression/sadness and nervous complaints on a four grade scale (always, often=1; seldom, never=0) during the previous 12 months. Thus, a composite index of nine psychological symptoms was constructed with a range from 0 to 9, where higher values corresponded to more psychological problems. The cut-off point was set at 90th percentile. In papers II and III, the six questions about nervous symptoms were combined into an index with the range from 0 to 6. Different cut-off points were tested in the regression analyses. The guiding principle was to dichotomise at the 75th percentile.

The smoking variable was defined as daily cigarette smoking if a person smoked at least one cigarette per day (Paper I). Those who never had smoked, who smoked occasionally or who had stopped smoking were considered as non-smokers and belonged to the reference group.
Alcohol consumption (Paper IV) was measured with a battery of questions about frequency and amount of alcohol consumption. The volume of different alcoholic beverages was converted into decilitres of pure alcohol. Beer was considered to contain 4.5% alcohol, wine 10% and sprits 40% alcohol. The estimate average alcohol volume for each alcohol type was calculated by multiplying the occasions per year on which alcohol was drunk by the volume of alcohol at each occasion. The resulting product was the approximate per annum alcohol consumption in decilitres of pure alcohol. There is no knowledge about the exact amount of alcohol consumption that could be harmful for health; therefore the dichotomisation was made at the 75th percentile to identify those with more unfavourable drinking habits. At age 16 the 75th percentile corresponded to 12.50 and 9.72 decilitres pure alcohol/year among for men, respectively women, and at age 30 the 75th percentile was 33.28 and 12.24 decilitres pure alcohol/year among for men, respectively women. Drinking equal to or above the 75th percentile was defined as high alcohol consumption, and those consuming less were used as a reference group.

A measure of self-rated health was used in paper IV. Self-rated health was estimated through the single question at age 30 “How would you rate your overall health?” Possible answers were “good” (=0), “bad” or “neither good nor bad” (=1, defined as suboptimal self rated health).

Statistics

Versions 10.0 to 15.0 of the SPSS and 10.0 of STATA statistical packages were used for data analyses.

Chi-square analyses were used in all studies to analyse differences in the dichotomous variables. T-tests were used for continuous variables. A p-value <0.05 was chosen as statistically significant in all analyses.

Factor analyses were used to construct indices by choosing variables that expressed the same underlying phenomena.

Correlation was used to describe the degree of relationship between two variables.

Logistic regression

Logistic regression was used to predict the odds, e.g. for having poor health among the unemployed. Both bivariate and multivariate logistic regression analyses were used in the present thesis. Confidence interval of 95% was chosen to be statistically significant. Logistic regression is often used in
epidemiological studies where the result of the analysis is the probability of developing a certain disease after controlling for other associated risks.

Backward stepwise regression, used in Paper III, is a preferred method of exploratory analyses, where the analysis begins with a full or saturated model and variables are eliminated from the model in an iterative process. Logistic regression, as a common method for adjustment for background variables, was used in this thesis to analyse dichotomous outcomes.

**Propensity score matching**

The basic idea of propensity score methods (PSM) (Rosenbaum & Rubin, 1983) is to replace the collection of confounding covariates in an observational study with one function of these covariates, called the propensity score (that is, the propensity to receive treatment rather than not being treated). This score is then used just as if it was the only confounding covariate. Thus, the collection of predictors is collapsed into a single predictor. The propensity score is found by predicting treatment group membership (that is, the indicator variable for being in treatment group 1 as opposed to non-treated group) from the confounding covariates, for example, by a logistic regression or discriminant analysis. In this prediction of treatment group measurement, it is critically important that the outcome variable plays no role; the prediction of treatment group must involve only the covariates. Each person in the database then has an estimated propensity score, which is the estimated probability (as determined by that person's covariate values) of being exposed to treatment 1 rather than non-treatment. This propensity score is then the single summarized confounding covariate to be used for subclassification (Rubin, 1997). Thus, propensity score method might be assumed as an alternative method to build pairs that are similar as it is in a randomised controlled trial (Larsson, 2003). PSM method has been widely used in economic studies evaluating the effect of labour market programmes, but is more seldom used in the public health area. We applied the PSM method in order reduce the background selection and compare what happens to the health status after being assigned to so called "treatment" with labour marker programmes. Therefore, background factors that affect treatment as well as factors which affect the outcome should be used when estimating the propensity score (Granlund, Rudholm, & Wikström, 2006).

**Missing values**

Although the number of missing values was low, imputation procedure was used in order to eliminate all missing values, as required by version 10.0 of the STATA statistical package. Thus, all cases were included in the PSM
analyses. For the dichotomized variables we replaced each missing value with a value of a reference variable (Rubin 1987).

**Results (Papers I-IV)**

**Paper I**

After controlling for several background variables, associations between long-term unemployment and poor psychological health (dichotomised in Paper I at the 90th percentile of a nine-item scale) were found in young men (OR=4.79, 95% CI 2.24-10.23) and women (OR=2.71, 95% CI 1.24-5.88), and adult men (OR=2.29, 95% CI 1.08-4.85). Long-term unemployment was only associated with smoking in young people (men, OR=2.42, 95% CI 1.51-3.91; women, OR 5.48, 95% CI 3.21-9.35).

In order to also test other measures of psychological symptoms including those used in Papers II and III new analyses were performed with different cut-off points among young people (Table 2) as well as among adults (Table 3). Moreover, adjustment was done for health-related selection, which was not performed in the published version of Paper I.
Table 2. Multivariate logistic regression for having poor psychological health among young adults in relation to long-term unemployment\(^1\) (comparison between the 90\(^{\text{th}}\) percentile and 75\(^{\text{th}}\) percentile using nine respective six-item scale).

<table>
<thead>
<tr>
<th></th>
<th>Nine-item scale</th>
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<th>Six-item scale</th>
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<tbody>
<tr>
<td></td>
<td>90(^{\text{th}}) percentile(^2)</td>
<td>75(^{\text{th}}) percentile</td>
<td>90(^{\text{th}}) percentile</td>
<td>75(^{\text{th}}) percentile(^5)</td>
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<tr>
<td><strong>Men</strong></td>
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<td><strong>Model 1 (Bivariate):</strong></td>
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<tr>
<td>Long-term unemployment &amp; 4.97 (2.79-8.86) &amp; 2.75 (1.69-4.48) &amp; 3.27 (1.89-5.66) &amp; 1.55 (0.95-2.54)</td>
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<td><strong>Model 2 (Multivariate):</strong></td>
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<td>Model 1+health selection(^2) &amp; 3.35 (0.82-13.7) &amp; 2.70 (1.61-4.52) &amp; 3.27 (1.84-5.81) &amp; 1.61 (0.98-2.64)</td>
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<td><strong>Model 3 (Multivariate):</strong></td>
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<tr>
<td>Model 1+all moderating and mediating variables(^3) &amp; 4.79 (2.24-10.2) &amp; 2.29 (1.36-3.89) &amp; 3.11 (1.87-5.86) &amp; 1.72 (1.01-2.93)</td>
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<td></td>
</tr>
<tr>
<td><strong>Model 4: (Multivariate):</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 2+3 &amp; 5.19 (1.17-23.1) &amp; 2.40 (1.38-4.15) &amp; 2.85 (1.54-5.27) &amp; 1.77 (1.04-3.02)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Model 1 (Bivariate):</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term unemployment &amp; 4.03 (2.25-7.19) &amp; 2.90 (1.79-4.71) &amp; 4.01 (2.38-6.78) &amp; 1.02 (0.61-1.70)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Model 2 (Multivariate):</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 1+health selection(^2) &amp; 3.83 (1.49-9.88) &amp; 2.55 (1.53-4.24) &amp; 3.85 (2.24-6.62) &amp; 1.03 (0.98-2.64)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Model 3 (Multivariate):</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 1+all moderating and mediating variables(^3) &amp; 2.71 (1.24-5.88) &amp; 2.43 (1.44-4.10) &amp; 3.31 (1.87-5.86) &amp; 0.98 (0.57-1.68)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Model 4: (Multivariate):</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model 2+3 &amp; 3.83 (1.37-10.7) &amp; 2.37 (1.38-4.09) &amp; 3.37 (1.88-6.05) &amp; 0.98 (0.57-1.68)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Long-term unemployment defined in accordance with the definition in Paper I, i.e. continuously unemployed for 6 months or more during the previous 5-year period between ages 16-21.

\(^2\) Health selection – psychological health at age 16.

\(^3\) Mediating and moderating variables included in the model were having children, poor financial position, own working-class, working-class parents, low control, unemployed relatives and high work involvement.

\(^4\) Dichotomisation as in Paper I.

\(^5\) Dichotomisation as in Paper II and Paper III.
Generally, quite consistent significant associations between unemployment and psychological symptoms measured with different cut-off points were found for both young men and women, of which most remained significant after control for health related selection. The main exception was the measure of psychological health dichotomised at the 75th percentile on a six-item scale (i.e. the measure used in Papers II and III) among young people and the 75th percentile on a nine-item scale among adults. Associations between unemployment and poor psychological health were not found in any of the analyses for adult women.
Paper II

As shown in Table 4, after controlling for gender as well as for an indicator of health-related selection, possible confounders and mediators, an association was found between the lower probability of psychological symptoms and obtaining permanent employment (OR=0.35, 95% CI 0.19-0.63) as well as having permanent employment (OR=0.22, 95% CI 0.10-0.51).

Table 4. Multivariate logistic regression for psychological symptoms (75th percentile) in relation to labour market position after controlling for the indicator of health-related selection as well as possible confounders and mediators [odds ratios (OR), 95% confidence intervals (95%CI)].

<table>
<thead>
<tr>
<th>Labour market position between age 25 and age 30</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without employment (Reference)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Obtained employment</td>
<td>0.35</td>
<td>0.19-0.63</td>
</tr>
<tr>
<td>Permanent employment</td>
<td>0.22</td>
<td>0.10-0.51</td>
</tr>
<tr>
<td>Gender</td>
<td>0.93</td>
<td>0.63-1.36</td>
</tr>
<tr>
<td>Psychological symptoms (16)</td>
<td>2.18</td>
<td>1.48-3.23</td>
</tr>
<tr>
<td>Unemployed at young age (16–21)</td>
<td>1.26</td>
<td>0.74-2.15</td>
</tr>
<tr>
<td>Have children (21)</td>
<td>0.92</td>
<td>0.46-1.83</td>
</tr>
<tr>
<td>Financial problems (21)</td>
<td>1.47</td>
<td>0.99-2.17</td>
</tr>
<tr>
<td>Unemployed relatives (21)</td>
<td>1.19</td>
<td>0.62-2.25</td>
</tr>
<tr>
<td>Blue-collar worker (30)</td>
<td>0.67</td>
<td>0.44-1.02</td>
</tr>
<tr>
<td>Do not have a chance to do what I would prefer to do (30)</td>
<td>1.76</td>
<td>1.19-2.61</td>
</tr>
<tr>
<td>High WIS (30)</td>
<td>1.01</td>
<td>0.66-1.55</td>
</tr>
<tr>
<td>High demands (30)</td>
<td>1.57</td>
<td>1.07-2.31</td>
</tr>
<tr>
<td>Low control (30)</td>
<td>0.79</td>
<td>0.50-1.24</td>
</tr>
<tr>
<td>Poor social network (30)</td>
<td>0.71</td>
<td>0.46-1.10</td>
</tr>
<tr>
<td>Poor social support (30)</td>
<td>1.45</td>
<td>0.97-2.18</td>
</tr>
<tr>
<td>Risk of unemployment (30)</td>
<td>1.04</td>
<td>0.69-1.59</td>
</tr>
<tr>
<td>People look down on me (30)</td>
<td>2.01</td>
<td>1.33-3.04</td>
</tr>
</tbody>
</table>

Paper III

Psychological symptoms among participants of active labour market programmes (ALMP) and unemployed (UNALMP) did not differ significantly. Associations between participation in ALMP and psychological symptoms were not found in any age group (see Paper III). Adjustment for all background selection variables (see Paper III) (Table 5, Model 2) or the propensity score (see Paper III) (Table 5, Model 3) in multivariate logistic regression showed similar associations.
### Table 5. Comparison of the association between participation in active labour market programmes (ALMP) and psychological symptoms using multivariate logistic regression model, adjusted for background selection variables\(^1\), propensity score\(^2\), confounders\(^3\), and propensity score and confounders together at ages 21 and 30 for full sample, men and women; OR; 95% CI.

<table>
<thead>
<tr>
<th>Model</th>
<th>AGE 21</th>
<th>AGE 30</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>OR (95% CI)</td>
</tr>
<tr>
<td>Model 1: Crude model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full sample</td>
<td>0.70 (0.45-1.10)</td>
<td>0.75 (0.38-1.49)</td>
</tr>
<tr>
<td>Men</td>
<td>0.67 (0.56-1.25)</td>
<td>0.79 (0.33-1.89)</td>
</tr>
<tr>
<td>Women</td>
<td>0.73 (0.38-1.40)</td>
<td>0.71 (0.24-2.14)</td>
</tr>
<tr>
<td>Model 2: Adjusted for background selection variables at age 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full sample</td>
<td>0.74 (0.47-1.18)</td>
<td>0.69 (0.31-1.52)</td>
</tr>
<tr>
<td>Men</td>
<td>0.78 (0.39-1.54)</td>
<td>0.50 (0.12-2.01)</td>
</tr>
<tr>
<td>Women</td>
<td>0.71 (0.37-1.38)</td>
<td>0.70 (0.33-1.50)</td>
</tr>
<tr>
<td>Model 3: Adjusted for propensity score at age 16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full sample</td>
<td>0.73 (0.46-1.18)</td>
<td>0.70 (0.33-1.50)</td>
</tr>
<tr>
<td>Men</td>
<td>0.73 (0.38-1.40)</td>
<td>0.83 (0.31-2.19)</td>
</tr>
<tr>
<td>Women</td>
<td>0.73 (0.38-1.39)</td>
<td>0.50 (0.14-1.81)</td>
</tr>
<tr>
<td>Model 4: Adjusted for confounders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full sample</td>
<td>0.70 (0.44-1.09)</td>
<td>0.81 (0.38-1.73)</td>
</tr>
<tr>
<td>Men</td>
<td>0.77 (0.38-1.56)</td>
<td>0.38 (0.09-1.59)</td>
</tr>
<tr>
<td>Women</td>
<td>0.70 (0.36-1.19)</td>
<td>0.54 (0.12-2.43)</td>
</tr>
<tr>
<td>Model 5: Model 2+4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full sample</td>
<td>0.74 (0.46-1.17)</td>
<td>0.65 (0.27-1.56)</td>
</tr>
<tr>
<td>Men</td>
<td>0.65 (0.34-1.24)</td>
<td>0.61 (0.21-1.81)</td>
</tr>
<tr>
<td>Women</td>
<td>0.73 (0.38-1.42)</td>
<td>0.79 (0.24-2.60)</td>
</tr>
<tr>
<td>Model 6: Model 3+4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full sample</td>
<td>0.71 (0.45-1.12)</td>
<td>0.69 (0.29-1.61)</td>
</tr>
<tr>
<td>Men</td>
<td>0.71 (0.37-1.38)</td>
<td>0.42 (0.10-1.80)</td>
</tr>
<tr>
<td>Women</td>
<td>0.72 (0.37-1.40)</td>
<td>0.58 (0.18-1.93)</td>
</tr>
</tbody>
</table>

**Note:**
\(^1\) All background selection variables at age 16, \(^2\) propensity score of the background selection variables at age 16, \(^3\) adjusted for the present situation at the labour market, level of education, social class and financial position at ages 21 and 30.

Due to methodological shortages the results must be interpreted with caution.

**Paper IV**

As shown in Tables 6 and 7, significant associations between unemployment and suboptimal self-rated health among women and high alcohol consumption among were found. The associations remained significant after adjustment for health-related selection, as well as after controlling for potential mediators and moderators.
Table 6. Odds ratio (and 95% CI) in logistic regression analyses for suboptimal self-rated health in relation to unemployment, when adjusted for potential confounders. Model 1: bivariate analyses. Model 2: multivariate analyses for the association between unemployment and suboptimal self-rated health, adjusted for each of the potential mediators and all moderators. Women

<table>
<thead>
<tr>
<th>Variables (age 30)</th>
<th>Model 1 (bivariate)</th>
<th>Model 2 (multivariate) adjusted for each potential mediator separately and all moderators</th>
<th>Proportions (% of change) of odds for having suboptimal self-rated health related to unemployment that is explained by each potential mediator</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR, 95% CI</td>
<td>OR, 95% CI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment</td>
<td>3.31 (1.85-5.92)</td>
<td>2.72 (1.45-5.10)</td>
<td>-</td>
</tr>
<tr>
<td>adjusted for potential mediators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for financial difficulties</td>
<td>2.45 (1.30-4.62)</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for low perceived control</td>
<td>2.76 (1.48-5.12)</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for poor social network</td>
<td>2.70 (1.45-5.04)</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for poor social support</td>
<td>2.84 (1.53-5.27)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for unemployed friends</td>
<td>2.73 (1.46-5.10)</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for feeling looked down upon</td>
<td>2.65 (1.42-4.97)</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for future pessimism</td>
<td>2.32 (1.21-4.46)</td>
<td>43</td>
<td></td>
</tr>
</tbody>
</table>

* Multivariate analyses: unemployment adjusted for each of the potential mediators separately, health-related selection at age 16 as well as for all moderators (early unemployment between ages 16-21, blue-collar occupation at age 30, and having children at age 30)

* Reduction of the odds for suboptimal self-rated health in relation to unemployment after full adjustment i.e. for each of the potential mediators and all moderators. Percentage of change: (unadjusted model-fully adjusted model)x100/(unadjusted model-1), e.g. 3.31-2.45x100/(3.31-1) for suboptimal self-rated health in relation unemployment when adjusted for financial difficulties and all moderators
Table 7. Odds ratio (and 95% CI) in logistic regression analyses for high alcohol consumption in relation to unemployment, when adjusted for potential confounders. Model 1: bivariate analyses. Model 2: multivariate analyses for the association between unemployment and high alcohol consumption, adjusted for each of the potential mediators and all moderators. Men

<table>
<thead>
<tr>
<th>Variables (age 30)</th>
<th>Model 1 (bivariate)</th>
<th>Model 2 (multivariate) adjusted for each potential mediator separately and all moderators a</th>
<th>Proportions (% of change) of odds for having suboptimal self-rated health related to unemployment that is explained by each potential mediator b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>2.14 (1.18-3.89)</td>
<td>2.07 (1.09-3.96)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>adjusted for potential mediators</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for financial difficulties</td>
<td>2.03 (1.05-3.92)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for low perceived control</td>
<td>2.15 (1.12-4.11)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for poor social network</td>
<td>2.14 (1.11-4.11)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for poor social support</td>
<td>2.08 (1.09-3.98)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for unemployed friends</td>
<td>2.12 (1.10-4.10)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for feeling looked down upon</td>
<td>2.34 (1.16-4.31)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for future pessimism</td>
<td>1.95 (1.02-3.74)</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

a Multivariate analyses: unemployment adjusted for each of the potential mediators separately, health-related selection at age 16 as well as for all moderators (early unemployment between ages 16-21, blue-collar occupation at age 30, and having children at age 30)
b Reduction of the odds for high alcohol consumption in relation to unemployment after full adjustment i.e. for each of the potential mediators and all moderators. Percentage of change: (unadjusted model-fully adjusted model)x100/(unadjusted model-1), e.g. 2.14-2.03x100/(2.14-1) for high alcohol consumption in relation unemployment when adjusted for financial difficulties and all moderators.
Table 7. Odds ratio (and 95% CI) in logistic regression analyses for high alcohol consumption in relation to unemployment, when adjusted for potential confounders. Model 1: bivariate analyses. Model 2: multivariate analyses for the association between unemployment and high alcohol consumption among men, adjusted for each of the potential mediators and all moderators.

<table>
<thead>
<tr>
<th>Variables (age 30)</th>
<th>Model 1 (bivariate)</th>
<th>Model 2 (multivariate adjusted for each potential mediator separately and all moderators a)</th>
<th>Proportions (% of change) of odds for having suboptimal self-rated health related to unemployment that is explained by each potential mediator b</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR, 95% CI</td>
<td>OR, 95% CI</td>
<td></td>
</tr>
<tr>
<td>Unemployment</td>
<td>2.14 (1.18-3.89)</td>
<td>2.07 (1.09-3.96)</td>
<td>-</td>
</tr>
<tr>
<td>adjusted for potential mediators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for financial difficulties</td>
<td>2.03 (1.05-3.92)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for low perceived control</td>
<td>2.15 (1.12-4.11)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for poor social network</td>
<td>2.14 (1.11-4.11)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for poor social support</td>
<td>2.08 (1.09-3.98)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for unemployed friends</td>
<td>2.12 (1.10-4.10)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for feeling looked down upon</td>
<td>2.34 (1.16-4.31)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for future pessimism</td>
<td>1.95 (1.02-3.74)</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

a Multivariate analyses: unemployment adjusted for each of the potential mediators separately, health-related selection at age 16 as well as for all moderators (early unemployment between ages 16-21, blue-collar occupation at age 30, and having children at age 30). Reduction of the odds for high alcohol consumption in relation to unemployment after full adjustment i.e. for each of the potential mediators and all moderators. Percentage of change: (unadjusted model - fully adjusted model)x100/(unadjusted model - 1), e.g. 2.14-2.03x100/(2.14-1) for high alcohol consumption in relation unemployment when adjusted for financial difficulties and all moderators.

Discussion

In summary, the main findings of this thesis were: (I) unemployment seemed to be more health-deteriorating for young people than for adults. (II) The transition from an unstable labour market position to permanent employment was health-promoting among both men and women. (III) Labour market programmes available in 1980s for young people and mid
1990s for adults were not related to psychological symptoms. (IV) A strong association between unemployment and suboptimal self-rated health among women and high alcohol consumption among men was found and a theory of structural relations is used to explain the gendered patterns for ill health.

**Methodological considerations**

The main advantages of this study were the longitudinal design and the exceptionally high response rate, which was as high as 96.4% in the 14-year follow-up. The non-response rate is usually high in long-term longitudinal studies. However, it is important, especially in studies about labour market trajectories, to have high response rate in order to include marginalised people who are non-responders in other research (Novo, Hammarström, & Janlert, 1999). Earlier research has shown that even a low non-response rate can introduce serious bias and uncertain results (ibid).

Another advantage of this study is that it was based on validated and previously used questionnaires and investigations. The questionnaire for the cohort study was constructed in the 1980s, and it included items from the Swedish national survey of living conditions (Statistics Sweden, 1979), the Low Income study (Johansson, 1970) and the Swedish council for information on alcohol and other drugs (Hibell & Jonsson, 1982) that are still after 20-30 years relevant measures in public health research. The original measures and scales are to a large extent kept in order to ensure their comparability during the whole study.

Also, my thesis has an extraordinary high relevance in the public health area, not least because of the rapid recession in global markets during the second half of 2008 and at the time of finalising this thesis. This thesis, like all other research, raises a question of relevance and generalizability of the results, and whether this doctoral project adds new knowledge to the field of public health.

I used quantitative methods in my thesis for analysing the data in order to make it possible to compare variables between and within the groups included in the study. Moreover, conclusions could be made which are valid for larger populations than those surveyed. This method also made it possible to estimate the strength of the association of unemployment with ill health as well as to study the interactions and the relations between the different variables. Research on unemployment has been carried out within different scientific disciplines and methodologies, but a gender theoretical approach in quantitative research is relatively new (Hammarström, 2007). Qualitative studies, in contrast, are common in gender research and have become more common also in public health research over the past two decades (Baum, 2008). Qualitative research methods could provide a better understanding on how unemployed men and women experience their health.
in relation to their life circumstances as well as about which mechanisms that could explain the relationship between unemployment and health. For me, language problems made it difficult to perform a qualitative study. But a combination of both qualitative and quantitative designs would be desirable in future unemployment research.

Although the longitudinal design of the study made it possible to control for the health-related selection - i.e. the health situation at age 16 before the entry into the labour market - a potential problem regards which time is best to measure the indicators of health-related selection. At age 16 the cohort participants were still in compulsory school and thus had not yet been exposed to the labour market. But the late teenage years and early adulthood are the period of greatest risk for onset of affective disorders and therefore the health at age 18 or 21 may have been more appropriate to use. However, at those ages the cohort had already been exposed to the labour market which could have affected their health status. For example, half of the cohort had experienced unemployment at age 21 and earlier research has shown the negative health consequences of unemployment already at young ages such as 18 (Hammarström, Janlert, & Theorell, 1988a) and 21 (Hammarström & Janlert, 2002; Novo, 2000; Novo, Hammarström, & Janlert, 2000a).

The cohort was followed-up with varying time intervals (age 16, age 18, age 21 and age 30). Ideally, the follow-ups would have been performed with shorter intervals even after the age of 21, but there are ethical and practical limits how often the cohort can be contacted.

There can be possible information or recall bias in relation to the self-reported health problems which I have used. Not only the recall period, but also emotional load connected to dramatic life events like unemployment, might influence the reporting the health measures (Blane, 1996). However, the recall period in the Northern Swedish cohort study is a maximum of one year. Nevertheless, as shown by another Swedish study on self-reported health, self-reported symptoms are predicative of future medical diagnosis (Emmelin, Weinehall, Stegmayr, Dahlgren, Stenlund, & Wall, 2003). Also, smoking (Krall, Valdian, Dwyer, & J, 1989) and alcohol consumption (Grant, Arciniega, Tonigan, Miller, & Meyers, 1997) have been shown to be recalled with useful accuracy during a long time period.

It has been suggested that studies on labour market position should move away from the comparison between employed and unemployed towards a more dynamic comparison of workers with stable versus unstable jobs (Benavides, Benach, Diez-Roux et al., 2000; Dooley, 2003). Employment in the “insecure periphery”, characterised by various non-permanent job contracts (Virtanen, Kivimäki, Joensuu, Virtanen, Elovainio, & Vahtera, 2005; Virtanen, Liukkonen, Vahtera, Kivimäki, & Koskenvuo, 2003) have become more common due to the instability of labour market structures. Thus, the four papers included in the present thesis tested different
exposures of unemployment, including both the traditional definition of unemployment and a more recent concept of insecure, unstable labour market positions in order to analyse the associations with ill health.

Also, the duration of unemployment has always been an important source of discussions among unemployment researchers, which also raises the methodological question about defining the exposure time to unemployment in our studies. Most of the longitudinal studies point out that long-term unemployment is more related to ill health than short-term unemployment (Fergusson, Horwood, & Woodward, 2001; Gordo, 2006; Mossakowski, 2008). We tested different time periods of exposure to unemployment in different papers as there is no consensus about the exact length of what should be considered as long-term exposure to unemployment. Association with low well-being has been found strongest after nine months of unemployment among young people (Winefield & Tiggeman, 1990) and after a year or more among adults (Gordo, 2006; Kokko, Pulkkinen, & Puustinen, 2000). Even exposure to half a year of unemployment in young ages has been used as a measure of long-term unemployment in previous research among young people (Hammarström & Janlert, 2002). Another methodological question is how close to the health outcome one should measure the exposure to unemployment. Associations between current unemployment and health status is often used alone or in combination with other measures of exposure (Hammarström & Janlert, 1997). Also, recent exposure to unemployment (up to six months) is often used, for example in a study about unemployment and alcohol consumption (San José, van Oers, van de Mheen et al., 2000). It has also been shown that unemployment in a young age may have long term effects on health in adulthood (Hammarström & Janlert, 2002). Thus, it was methodologically difficult to choose the optimal time for measuring exposure to unemployment. We tested different lengths of unemployment and different timing in the four papers. For example, in Paper IV we included current as well as previous unemployment for half a year or more during a 9-year period, which was adjusted for long-term (six months) unemployment in a young age.

In Paper I we dichotomised psychological symptoms at the 90th percentile in order to detect those having the poorest health. However, in the following papers the guiding principle was to dichotomise all the scales at the 75th percentile, because of the potential problem with the statistical power. Due to the young age of cohort, the number of persons with high scores in the measure of psychological symptoms is small, and the cut-off point for psychological symptoms should be set both to detect a group at risk and avoid Type II errors arising from a small number of subjects in the subgroups. When retesting different cut-off points for poor psychological health, I obtained somewhat different results from the original
dichotomisation of the nine-item scale at the 90th percentile (see Tables 2 and 3) but the main results remained.

The differences in health related to unemployment might relate to gender as well as to other forms of heterogeneity among the unemployed people. In the papers included in the thesis I attempted to control for many different factors related to the potential heterogeneity of the studied populations. However, there may be multiple pathways through which unemployment affects health. Each paper had specific research questions that required theoretical inclusion of different factors that could be defined as mediators, moderators or confounders, or a mix that might have a potential impact on the association between unemployment (and unstable labour market positions) and poor health. However, it is not always possible to define whether a variable could be regarded as mediator, moderator or confounder and how the particular variable affects the association between unemployment and poor health.

Social class, age and gender are important factors related to measurable heterogeneity. Unmeasured gender relations and preferences (e.g. power structures, symbolic and emotional relations and attitudes) are attributable to unobservable heterogeneity, and could be better understood with qualitative methods. The discussion of possible confounders in our studies, however, has to be hypothetical. There is a problem of estimating the relationship between labour market position and health status during a relatively long time period, as it is impossible to control for all conceivable circumstances that can influence the studied populations. However, I have controlled for several important confounders that have shown a considerable impact on the association between unemployment and ill health.

Ethnicity is important not only as measurable heterogeneity, but also as one of the major sources of inequality in the labour market as well as in health status (Browne & Misra, 2003). The population in the Northern Swedish cohort was rather homogenous as regards to their ethnical origin i.e. 87.7 % of the pupils’ mothers and 91.7 % fathers were born in Sweden, and 87.9 % spoke Swedish in the family (Hammarström, 1986). Almost 96 % of the pupils were born in Sweden; of those 78.6 % in the Northern part of Sweden and 17.1 % elsewhere in Sweden. Finnish was the ethnical minority with the highest representation, and other ethnicities were few. Earlier research has shown that ethnicity in The Northern Swedish cohort was not adversely related to health (Hammarström, 1986), which could be explained by the relative homogeneity of the studied population as well as the fact that most of the immigrants were well-established people from Finland with similar culture and language. Finnish immigrants were in most cases bilingual and spoke Swedish, and therefore might experience smoother integration in the Swedish society. Also, marginalisation in the labour
market did not seem to be associated with the ethnical minorities of the cohort.

Despite my intention to have a gender perspective throughout the thesis, the analyses in Paper II were performed without gender stratification in order to ensure the statistical power and avoid the risk of Type II errors. Interaction between gender and labour market position was assessed with multiplicative interaction. Although our findings indicated that reemployment was protecting mental health both among men and women, we were not able to provide gender interpretation of our results which is an important limitation of the paper.

The main methodological problems in Paper III concern the short exposure to ALMP. We used the 75th percentile in order to get a highly exposed group, but still the total time in ALMP was quite short. Also, there was a lack of information about the exact timing of the measures. The possible health effects at for example age 30 may of course differ depending on if you are exposed to ALMP at age 22 or at age 29. This relates to another methodological problem – the relatively long time between the follow-ups. Ideally, studies designed to analyse the relation between ALMP and health status should have more frequent follow-ups due to the fact that the time in ALMP is limited. Also, our study could not separate between the different types of ALMP, which could explain the different findings in this study compared to earlier research. Finally, due to small sample size the lack of associations between ALMP and psychological symptoms may depend on Type 2 error.

**On the results**

*Are there differences in the association between long-term unemployment and ill health among young people and adults? (Paper I)*

Unemployment is supposed to be more stressful if a person has greater financial responsibilities; therefore, unemployment is expected to affect psychological health to a greater extent in adulthood than at younger ages. Paper I challenged this assumption by testing whether the association between ill health and long-term unemployment differed between young people and adults in the Northern Swedish cohort study. Generally, long-term unemployment was found to be more related to ill health in young people than in adults. These results are in contrast to the majority of earlier findings (Breslin & Mustard, 2003; Feather, 1990; Fryer, 1999).

The association between unemployment and smoking among young men and women, however, was in line with earlier research (Gilmore, McKee, Telishevsksa, & Rose, 2001; Osler, Holstein, Avlund, Damsgaard, & Rasmussen, 2001).
The relationship between unemployment and different measures of poor psychological health gave inconsistent results for adult men (Table 3). Therefore, we should interpret the potential association between unemployment and poor psychological health among adult men with caution.

A theory of gender relations (Connell, 2006b) may provide explanation for our results. The high odds for having poor psychological health and smoking among unemployed young men in our study indicated that entering labour market could still be an important masculinity-making arena (Connell, 2001, 2006b) in Sweden. Hegemonic masculinity is constructed around active participation in the labour market (Connell & Messerschmidt, 2005), and young unemployed men might be unable to enter labour market that may lead to a subordinate status and may also increase the risk for deteriorated health and health behaviour (Courtenay, 2000).

Long-term unemployment was related to poor psychological health and smoking in young women, but not in adult women. Similarly to young men, paid work plays an integral role in the transition of young women into adulthood (Garcia Rodriguez, 1997), and could explain the high odds for poor psychological health among women in Paper I. The lack of association between long-term unemployment and poor psychological health in adult women might be explained by unsatisfactory employment that affects health to the same extent as unemployment (Gonäs, 1994). It is reasonable to believe that women in work might also be at higher risk of having psychological symptoms. Low-status occupations, wage gap, little opportunities to control the work situation, high levels of stress together with a threat of downsizing among women of all ages characterizes the current Swedish labour market (ibid).

Earlier research shows that smoking is more associated with unemployment in young people and those from lower socio-economic classes (Gilmore, McKee, Telishevska et al., 2001; Graham, 1987; Osler, Holstein, Avlund et al., 2001). Moreover, unemployment is a risk factor for development of smoking among young people (Hammarström, 1994a). In contrast to adults, young people are at greater risk of smoking under peer pressure. High odds for smoking among unemployed young people might be explained by potentially less meaningful activities compared with those at work or studies (Hammarström, 1996). Smoking could be explained by the psychosocial stress caused by unemployment (De Vogli & Santinello, 2005). Unemployment is a stressful life event and smoking could be perceived as stress releasing. Young unemployed people might seek relief in smoking (Jorm, Rodgers, & Jacomb, 1999) while adults may cope with stress-related experiences by other activities.

Although the higher engagement in risk behaviours remains largely unproblematic and taken for granted in men (Courtenay, 2000) the new
gender order reveals more fluid gender identities and behaviours (Annandale, 2002). One example could be that the constructions of the dominant form of femininity in present-day Swedish society more and more legitimize acting as ‘traditional men’ with increased smoking. Young people are more sensitive to these fluctuations of gender identities and behaviours. The convergence in male and female smoking is supposed to be the byproduct of a female lag in the process of cigarette adoption (Pamper, 2001).

Lower risk of having psychological symptoms after the transition from unemployment to employment (Paper II)

Paper II showed that reemployment after being in an unstable labour market position was associated with a lower probability of having psychological symptoms. Thus, our study indicated that the transition from unstable labour market position into permanent paid work seemed to improve psychological health among both men and women. This finding was supported by a number of other available studies in the field (Gordo, 2006; McKee-Ryan, Song, Wanberg, & Kinicki, 2005; Strandh, 2000), although there is also research indicating that reemployment might have a positive effect only if the obtained employment is secure and satisfactory (Aronsson & Göransson, 1999; Virtanen, Kivimäki, Joensuu et al., 2005; Virtanen, Vahtera, Kivimäki, Pentti, & Ferrie, 2002).

Due to low power, our results were analysed for men and women together. Even though we did not stratify by gender, the interaction analyses indicated that the association between acquisition of paid permanent job after unemployment and no psychological symptoms was related to both genders. This finding is supported by earlier research among both men and women (Gordo, 2006; Walters & Charles, 1997).

Women’s participation in the Swedish labour force is almost as high as for men. The dual earner families have become the norm and substituted the concept of the male breadwinner. Our findings that reemployment could be health promoting for both men and women could be better understood in relation to other Swedish findings showing that women valued work to the same extent as men (Isaksson, Johansson, Bellaagh et al., 2004). The study also showed that women experienced to a higher degree than men that the entitlement to employment was a norm. Thus, not only an economic but also a strong psychosocial need for employment (Nordenmark & Strandh, 1999) would explain the positive impact of reemployment among both men and women.
Active labour market measures unrelated to psychological symptoms (Paper III)

The findings indicate that there is a lack of associations between ALMP and psychological symptoms. However, due to the methodological shortages the results needs to be interpreted with caution. The methodological problems in our study may explain that our results are in contrast to earlier research within the field. A longitudinal panel study from Britain shows positive effects of government training on mental health measured with the General Health questionnaire (Hald Andersen, 2008). The effect remains after the end of the programmes but decreases over time. A one-year follow-up study in Finland showed that labour market interventions had a significant effect on psychological distress, but the effects seemed to be restricted to the actual time in the interventions (Vuori & Vesalainen, 1999). A Swedish longitudinal panel study analysed three different types of ALMP and showed that only those involving work place participation (in contrast to those involving activation and vocational training) had a positive effect on mental health (Strandh, 2001). A possible explanation of these findings is that work place participation involves participation on the regular labour market, which according to Jahoda (1981) may fulfil the psychological need for employment much better than the other two types of ALMP. The results from another Swedish study (with cross-sectional design) of an unemployment training programme showed that the women judged that their psychological health had been affected positively to a greater extent than the men did (Röjdalen, Gelin, & Ivergård, 2005). The different findings in this study compared to earlier research could depend on analyses of different types of ALMP – as our study could not separate between the different types. We agree with Hald Andersen (2008) who argues for the need of more empirical research about which theory that can best explain why government training has a positive effect on mental health.

Aggregate level research show that every increase by 10 USD per person in the investment in ALMP reduced the effect of unemployment on suicide by 0.038% (Stuckler, Basu, Suhrcke, Coutts, & McKee, 2009). When investment was more than 190 USD per person and year, unemployment had no adverse effects on suicide rate. Thus, it seems as if social expenditures in ALMP could mitigate some of the adverse effects of the recession.
Unemployment associated with suboptimal self-rated health and high alcohol consumption (Paper IV)

Associations between unemployment and suboptimal self-rated health were found among women (age 30), and unemployment and high alcohol consumption among men (age 30), even after controlling for indicators of health-related selection as well as for potential mediating and moderating factors. These findings are in line with other empirical research from Sweden (Molarius, Berglund, Eriksson et al., 2006; Åhs & Westerling, 2005) showing a strong association between poor-self-rated health and unemployment. Furthermore, recent results from the Belgian Health Interview Survey (van Praag, Bracke, Christiaens et al., 2009) as well as a large Finnish cohort (Virtanen, Vahtera, Broms et al., 2008) support our results showing that downward employment trajectory ending up in unemployment is related to problem drinking only among men. Similarly, a Dutch study indicated that chronic stressors such as unemployment were related to heavy drinking among men (José, van Oers, van de Mheen, Garretsen, & Mackenbach, 2000; San José, van Oers, van de Mheen et al., 2000). Even other factors, like separation or divorce, etc., were found to be related to drinking among both men and women thus suggesting that one should consider even other life factors that may have an impact on unfavourable health habits.

A question to be addressed is why no association between unemployment and suboptimal self-rated health was found among men, and why there was a lack of association between unemployment and high alcohol consumption among women. First, one should not rule out the possibility that different social groups (like men and women) have different thresholds for reporting ill health (Fritzell, Nermo, & Lundberg, 2004). There might also be possible reporting bias both as regards to self-reported health and alcohol consumption. Generally women tend to report more ill health than men (Baum, 2008), which could be explained by the gendered life circumstances in combination with different patterns and attitudes to illness. Men, on the other hand, may be more open to report on their alcohol patterns. Construction of hegemonic masculinity is often dangerous, unhealthy and restrained (Connell & Messerschmidt, 2005; Connell, 1995) and drinking is in particular symbolically associated with masculinity among subordinate and marginalised men (Courtenay, 2000). Excessive drinking, however, is not associated with traditional femininity and women might underestimate their alcohol consumption.

Possible mediating factors between unemployment and the health outcome were also analysed in our study. Although it is not possible to make exact comparisons between suboptimal self-rated health and excess alcohol consumption, the explanatory value of financial difficulties seemed to be stronger among women. The concept of the welfare state in Sweden is based on active participation in labour market to the same extent for men and
women (Gonäs, 1994). Employment is supposed to benefit both men and women by contributing to status and power as well as economic independence, social support, and self-esteem, compared to those unemployed (Ross & Mirowsky, 1995). However, the gendered division of labour can result in generally higher income among men (Connell & Messerschmidt, 2005), and the differences in the income were apparent among employed men and women in our study.

Future pessimism was found to have the highest explanatory value for ill health in relation to unemployment among women and men in our study. The period of recession in the Swedish labour market in mid 1990s was characterised by increasing health inequalities caused by unemployment. People generally had poorer prospects in the labour market (Novo, 2000), and having limited power and little ability to make their own choices which could also explain why future pessimism had a high substantial explanatory value among both genders in our study.

We found that low perceived control had a high explanatory value for suboptimal self-rated health among women only. In patriarchal societies men possess more power and women are commonly excluded from power and decision making as (Connell, 1996). Furthermore, unemployed, marginalised women are more often found in subordinate positions in the society, that may make them feel powerless (Connell, 2006b). An unemployment situation may mean that unemployed women have limited power to control their lives which could result in ill health (Walters & Charles, 1997).

Social support could be seen as a representation of the emotional dimension of gender relations (Connell, 2006b) and could be related to the traditional femininity. Social support is assumed to be higher valued for women than for men (Waters & Moore, 2002). In our study, poor social support and poor social network substantially explained the relationship between unemployment and suboptimal self-rated health among women. In contrast to earlier findings (Russell, 1999), we found that employed women had poorer social networks than those unemployed. Unemployed people had slightly more unemployed friends compared to those employed, which was also found in an earlier study (Russell, 1999). A review on social ties suggested that women’s networks might be generally more supportive than men’s (Kawachi & Berkman, 2001), and therefore are expected to provide more help during unemployment. But if the majority of the individual’s network is unemployed, they may be unable to provide social, financial and emotional support because of their own problems (Russell, 1999).

Feeling looked down upon seemed to explain the association between unemployment and suboptimal self-rated health among women considerably. The symbolic dimension of gender relations (Connell, 2002) involves employment as an increasingly important part of gender identity
creation among women and may be particularly relevant in the Swedish context with large proportion of women participating in the labour market. Thus, unemployment might be related to impaired self-image and make the unemployed women feel disrespected for being unemployed (Kulik, 2000). Besides, low self-esteem can lead to ill health (Walters & Charles, 1997).
Conclusions

Overall, my thesis indicated gendered patterns of relations between unemployment and the health outcomes, in the transition from youth to adulthood. The association between long-term unemployment and psychological health as well as smoking was stronger for young men and women compared with adults even after controlling for potential confounders. The transition from an unstable labour market position to permanent employment seemed to be health-promoting among both men and women, even after controlling for possible confounders and mediators, as well as an indicator of health-related selection. Due to methodological shortages the results about the lack of associations between active labour market participation and psychological symptoms have to be interpreted with caution. Finally, there were strong associations between unemployment and suboptimal self-rated health among women and high alcohol consumption among men, even after controlling for potential mediators and mediators. Structural theory of gender relations seemed to be useful in providing possible explanations. Overall, there is a need for more well-designed studies using a gender theoretical framework within the field.
Policy implications

Overall, my thesis indicated gendered patterns of relations between unemployment and the health outcomes, in the transition from youth to adulthood. A rapid increase in unemployment rates has occurred in 2009, and it could be expected that youth unemployment will continue to be a growing public health problem that requires further action. The policy implications of my thesis are that full employment policies should be promoted to reduce the health inequalities associated with unemployment. As unemployment seems to be more health-deteriorating for young people than adults, there is a need to prevent unemployment especially in young people.

The findings in the thesis may furthermore be converted into policy implications in public health policy. The overall aim of the Swedish public health policy is to create social conditions that will ensure good health on equal terms for the entire population (Ågren, 2003). My results can be implemented in at least two of the objectives, which are related to the labour market position. For the first objective ‘participation and influence in society’- full employment means improved possibilities for participation in the society. The other objective of main relevance for my thesis is objective four – ‘health in working life’. Unemployment has been chosen as a determinant for decreased inequalities in health related to the working life. Overall, there is a need for structural reforms that facilitate passage towards secure, stable jobs which will contribute to improved public health in general, and is also a necessary condition for sustainable growth. Therefore, transformation of unstable labour market positions into permanent employment could contribute to better public health.

Also, the WHO Commission of ‘Social Determinants of Health’ (CSDH, 2008) has emphasised the importance of combating unemployment in order to reduce health inequalities. Despite the vast knowledge on inequalities arising from social stratification and differential exposure to health risks, policies require further research considering the heterogeneity among the unemployed people. It is important for researchers, practitioners and policy makers to have a broader understanding of the role of gender in the association between unemployment and ill health. Analyses of the gender relations in the society are needed to provide better explanations for inequities in health among the unemployed men and women.
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Does the association between ill health and unemployment differ between young people and adults?
Results from a 14-year follow-up study with a focus on psychological health and smoking

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Introduction
Growing unemployment research has proved the association between unemployment and ill health not only for middle-aged men, but also for middle-aged women and young people.

A comparison between different age groups indicates that the health consequences of unemployment seem to differ; for example, health behaviour is affected to a greater extent in younger people. However, in spite of these obvious differences, there is a lack of actual studies that analyse...
the impact of age. Instead, many studies cover a wide age range or exclude one or more age groups.

There are several possible reasons why the health effects of unemployment may differ between young people and adults. Family situation and economic needs are different for young people and adults. Absence of family responsibilities and fewer economic restrictions place young people in a more favourable situation than adults in terms of the risk of economic stress. On the other hand, identity development through paid work may be more important for young people, as work plays an integral role in the transition into adulthood. Adults can be more secure and more experienced in their work identity. Thus, there is a need for more knowledge about the health effects of unemployment in different age groups.

Gender is a social, cultural and symbolic structuring practice that interacts with other social structures, for instance, age, class and ethnic background. Health-related beliefs and behaviours, among others, are tools for constructing gender. Each society has a gender order in which male domination is created and maintained. The gender order in society is the base for its gendered division of labour, resources and control.

The objective of this article was to analyse whether the association between ill health, particularly poor psychological health and smoking, and unemployment differs between young and adult men and women, and to discuss possible explanations from a gender perspective.

Population and method

In a prospective cohort study, carried out in a middle-sized industrialized town in northern Sweden, all 1083 pupils (506 girls and 577 boys) aged 16 years who attended or should have attended the last year of compulsory school in 1981 were followed for 14 years. Information on psychological and physical health, health behaviour, experiences of work and unemployment, and socio-economic data was collected throughout these years using comprehensive self-reported questionnaires at the ages of 16, 18, 21 and 30 years. The surveys from 1981 (when the respondents were 16 years old), 1986 (21 years) and 1995 (30 years) were used in this article. Complete data from all surveys were collected for 1044 individuals (547 men and 497 women), i.e. 96.4% of the original sample.

Extensive work was carried out to reach every participant, including those who had moved, in order to keep the non-response rate to a minimum. Data were collected during school hours (at the age of 16 years) and during class reunions (at the ages of 21 and 30 years). Questionnaires were sent to those who could not attend these reunions, followed by a reminder if necessary. Participants who failed to reply were contacted by telephone and interviewed, if they agreed to participate.

Two age groups were compared in this study; 21-year olds (defined as young people) and 30-year olds (defined as adults). A composite index of psychological symptoms was calculated from nine items about sleeping problems, depression and sadness, restlessness, nervousness, concentration problems, worries, anxiety, palpitations, and other nervous complaints during the previous year. The range of the index was 0–9, with higher values corresponding with more psychological problems. The internal consistency of the psychological index measured by Cronbach’s alpha was 0.77 for young people and 0.81 for adults. The distribution of the indices was skewed and the 90th percentile was used as a cut-off point for those who presented with psychological symptoms (young men n = 62, young women n = 62, adult men n = 76, adult women n = 70).

The smoking variable was defined as daily cigarette smoking (1, if a person smoked at least one cigarette per day). Those who never had smoked, who smoked occasionally or who had stopped smoking were considered as non-smokers (0).

Data about the length of unemployment were measured with a specially constructed battery of questions; if necessary, this was supplemented by an interview or with register data from the county labour board. For this study, we analysed 5-year prospective data at the ages of 21 and 30 years (from the age periods 16–21 years and 25–30 years). Those individuals who were unemployed continuously for 6 months or more during the previous 5-year period were considered as long-term unemployed (LTU). All others, i.e. those who were working, studying or participating in labour market programmes, were considered as non-long-term unemployed (NLTU). Thus, the population was divided into four groups: young LTU and NLTU, and adult LTU and NLTU. Table 1 shows that the LTU and the NLTU groups differed significantly with regard to the number of unemployed people at the time of the investigation as well as the total length of unemployment.

Financial position (cash margin) was measured with one question about the possibility of obtaining a certain amount of money within a week by one’s own means (coded as ‘yes’ = 1 or ‘no’ = 0). Social class was measured at the age of both 21 and 30 years according to the Swedish socio-economic
classification, SEI, and two socio-economic groups were identified: manual workers and non-manual workers, i.e., those who were professionals or white-collar workers. At 21 years of age, the students in the sample were mainly studying at university and were thereby considered as non-manual workers. Their parents’ social class was used as an indicator of social background at 16 years of age—those participants whose fathers were manual workers were considered to be of working-class origin. If the student lived with their mother but not their father, the mother’s social class was used instead of the father’s.

The index of control (with a range of 0–3) was constructed from three questions about the participants’ current situation (not being able to decide in different matters, not being able to make use of abilities and interests in their current situation, and not having the chance to do what they prefer). Those with at least two negative answers on control (each coded as ‘yes’ or ‘no’) were considered as a group with low control. Unemployment of someone in the family during the last year was defined as unemployed relatives (coded as ‘yes’ = 1 or ‘no’ = 0).

The work involvement scale (WIS) consisted of six seven-grade questions about work commitment. The range of the index was 0–42. High scores indicated high work involvement.

Statistics

Version 10.0 of the SPSS statistical package was used for data analysis. A P value < 0.05 for frequency was chosen as statistically significant. A 95% confidence interval for the odds ratio (OR) was used to compare the groups.

Cross-sectional analyses were used to compare young people with adults. Logistic regression was performed as bivariate when psychological health and daily cigarette smoking were tested for each of the independent variables, and multivariate when all independent variables were taken into account at the same time. Factor analysis was used to construct psychological and control indices. The correlation between the independent variables did not exceed 0.31. No interaction was found between these variables.

The Ethics Committees of Uppsala University (1986 survey) and Umeå University (1995 survey) approved the study.

Results

The frequencies for all variables used in this study are given in Table 2. Generally, LTU people scored higher values for the psychological index compared with NLTU people. However, the findings were not significant for adult women. Young LTU men had a higher score than adult LTU men.

Young people smoked more than adults, and women smoked more than men in both age groups (P < 0.001, not shown in the table). Among the young people, there was a significantly higher prevalence of daily smokers in the LTU group compared with the NLTU group. Among young men, the LTU group had more children than the NLTU group.

Among young people, the LTU group were more likely to have poor economy, lower control and working-class parents than the NLTU group. There were more unemployed relatives among LTU adults compared with NLTU adults. WIS was higher in NLTU young people than NLTU adults, but WIS did not differ significantly in LTU people of both ages.

### Table 1 Distribution of different measures of unemployment among long-term unemployed (LTU) compared to not long-term unemployed (NLTU) among young people and adults.

<table>
<thead>
<tr>
<th></th>
<th>Young</th>
<th>Adults</th>
<th>p</th>
<th>Young, mean</th>
<th>SD</th>
<th>Adults, mean</th>
<th>SD</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LTU</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed at the time of the investigation (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LTU</td>
<td>31.3</td>
<td>31.4</td>
<td>0.998</td>
<td>59.10</td>
<td>40.38</td>
<td>119.68</td>
<td>77.37</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>NLTU</td>
<td>4.5</td>
<td>6.5</td>
<td>0.192</td>
<td>3.40</td>
<td>5.79</td>
<td>6.97</td>
<td>23.50</td>
<td>0.131</td>
</tr>
<tr>
<td>p LTU/NLTU</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td></td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed at the time of the investigation (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LTU</td>
<td>22.9</td>
<td>38.3</td>
<td>0.091</td>
<td>48.22</td>
<td>29.48</td>
<td>125.88</td>
<td>69.13</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>NLTU</td>
<td>5.6</td>
<td>9.3</td>
<td>0.036</td>
<td>3.59</td>
<td>5.84</td>
<td>7.93</td>
<td>47.52</td>
<td>0.343</td>
</tr>
<tr>
<td>p LTU/NLTU</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td></td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p LTU men/women</td>
<td>0.222</td>
<td>0.513</td>
<td>0.049</td>
<td>0.049</td>
<td>0.707</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p NLTU men/women</td>
<td>0.585</td>
<td>0.102</td>
<td>0.643</td>
<td>0.829</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In the bivariate and the multivariate logistic regression analysis (Table 3), long-term unemployment was associated with poor psychological health, except for adult women. The OR was highest in young men.

Poor financial position was related to poor psychological health in all analyses in adult men and women, but only in the bivariate analysis in young men and women. Own working class was related to poor psychological health in all analyses.
in young men alone. Low control, was related to poor psychological health in all bivariate and multivariate analyses except for young men and adult women in the multivariate analysis. Unemployed relatives were also related to poor psychological health in adult men and young women.

Long-term unemployment was only associated with daily cigarette smoking in young people (Table 4). The OR was highest in young women.

Poor financial position was associated with smoking in all analyses except for young men in the multivariate analysis. Belonging to the working class was related to smoking in adult men and young women, all analyses in the bivariate analysis in young women only. High work involvement was only related to smoking in the multivariate analysis in adult women. Having children was associated with smoking.

Separate analyses excluding the students from the NLTU group showed no considerable changes of OR in the bivariate or the multivariate analyses (not shown in table).

Discussion

On the methods

It has been shown that even a low non-response can introduce a bias in studies of unemployment and health behaviour. Thus, the low non-response rate in this study can be considered to give a fair picture of the studied population.

The questionnaires were constructed using questions from validated studies in Scandinavian public health research. Reliability was tested by comparisons with a national survey given to the same population, using similar questions about tobacco consumption, and was found to be satisfactory. The municipality could be considered as representative of middle-size industrial towns.

Since our data were self-reported and covered a long period, the question of recall bias should be taken into account. It has been shown that occupational information can be recalled with useful accuracy, with the exception of respondents who change jobs frequently. As described in the Methods, we used a specially constructed battery of questions supplemented with register data to minimize this bias.

We asked for health status over the previous 12 months as we were mainly interested in the effects of long-term unemployment. Research shows that the longer the duration of unemployment, the worse are the health consequences. Several researchers, e.g. Maccoby, have found that short-term unemployment can be a welcome break and thus does not cause ill health. Therefore, we chose LTU people as those at risk of poorer health. Our results indicate that even the NLTU group could be affected by changes with regard to both age and the changed labour market. Besides, the NLTU group was not homogenous but consisted of several subgroups that

---

Table 4 Logistic regression for daily cigarette smoking among men and women in different age groups.

<table>
<thead>
<tr>
<th></th>
<th>Young adults bivariate</th>
<th>Young adults multivariate</th>
<th>Adults bivariate</th>
<th>Adults multivariate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR 95.0% CI</td>
<td>OR 95.0% CI</td>
<td>OR 95.0% CI</td>
<td>OR 95.0% CI</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term unemployment</td>
<td>2.43 1.51-3.91</td>
<td>1.98 1.06-3.69</td>
<td>1.28 0.68-2.41</td>
<td>1.11 0.57-2.17</td>
</tr>
<tr>
<td>Have children</td>
<td>0.70 0.31-1.59</td>
<td>0.71 0.29-1.77</td>
<td>1.01 0.68-1.48</td>
<td>0.93 0.62-1.40</td>
</tr>
<tr>
<td>Poor financial position</td>
<td>1.64 1.14-2.35</td>
<td>1.43 0.94-2.18</td>
<td>2.63 1.77-3.91</td>
<td>2.25 1.48-3.44</td>
</tr>
<tr>
<td>Working class (own)</td>
<td>1.20 0.76-1.88</td>
<td>1.20 0.74-1.94</td>
<td>2.05 1.38-3.03</td>
<td>1.67 1.09-2.56</td>
</tr>
<tr>
<td>Working class (parents)</td>
<td>0.98 0.68-1.40</td>
<td>0.89 0.58-1.37</td>
<td>1.17 0.79-1.73</td>
<td>0.95 0.62-1.44</td>
</tr>
<tr>
<td>Low control</td>
<td>1.05 0.73-1.50</td>
<td>1.12 0.74-1.71</td>
<td>1.36 0.91-2.03</td>
<td>1.16 0.76-1.78</td>
</tr>
<tr>
<td>Unemployed relatives</td>
<td>1.58 0.82-3.01</td>
<td>1.56 0.73-3.32</td>
<td>1.10 0.80-1.83</td>
<td>1.01 0.65-1.57</td>
</tr>
<tr>
<td>WIS</td>
<td>0.78 0.54-1.01</td>
<td>0.99 0.96-1.02</td>
<td>0.98 0.96-1.01</td>
<td>0.99 0.97-1.01</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term unemployment</td>
<td>5.48 3.21-9.35</td>
<td>4.48 2.25-8.90</td>
<td>1.13 0.54-2.34</td>
<td>1.10 0.51-2.37</td>
</tr>
<tr>
<td>Have children</td>
<td>2.08 1.20-3.61</td>
<td>1.62 0.81-3.22</td>
<td>1.10 0.73-1.64</td>
<td>1.03 0.68-1.57</td>
</tr>
<tr>
<td>Poor financial position</td>
<td>2.87 1.95-4.23</td>
<td>2.22 1.43-3.46</td>
<td>2.10 1.42-3.09</td>
<td>1.93 1.27-1.93</td>
</tr>
<tr>
<td>Working class (own)</td>
<td>2.20 1.47-3.28</td>
<td>1.72 1.11-2.68</td>
<td>1.63 1.11-2.40</td>
<td>1.35 0.89-2.04</td>
</tr>
<tr>
<td>Working class (parents)</td>
<td>1.92 0.83-1.71</td>
<td>1.00 0.65-1.56</td>
<td>0.98 0.60-1.29</td>
<td>0.74 0.50-1.10</td>
</tr>
<tr>
<td>Low control</td>
<td>1.15 0.82-1.64</td>
<td>1.03 0.67-1.58</td>
<td>1.40 0.95-2.05</td>
<td>1.31 0.87-1.97</td>
</tr>
<tr>
<td>Unemployed relatives</td>
<td>1.37 0.72-2.60</td>
<td>1.72 0.81-3.66</td>
<td>1.53 1.03-2.27</td>
<td>1.42 0.93-2.15</td>
</tr>
<tr>
<td>WIS</td>
<td>0.98 0.95-1.01</td>
<td>0.99 0.95-1.02</td>
<td>1.02 0.99-1.05</td>
<td>1.03 1.01-1.06</td>
</tr>
</tbody>
</table>
On the results

This study showed that the health effects of long-term unemployment differed between young people and adults. Long-term unemployment was more related to ill health and smoking in young people than in adults.

Psychological health

Unemployment is supposed to be more stressful if a person has greater financial responsibilities, including responsibilities for dependents. Therefore, unemployment has been expected to affect individuals’ psychological health to a greater extent in adulthood than at younger ages. However, our results show the reverse. The highest correlation was found in young men, which contradicts the earlier findings that unemployment has the biggest impact on adult men’s psychological health. Lower social class was also found to be an important variable, and similar results have been found in other studies. The dominant form of working-class masculinity is constructed around active participation in the labour market. Structural unemployment hinders young unemployed men from entering an important masculinity-making arena, which may lead to a subordinate status. Young men with unfavourable social features and thus poor health are at risk of being negatively selected out of the labour market into unemployment, which, in turn, can contribute to further health deterioration.

Other mediating factors turned out to be relevant for LTU adult men, giving a description of a marginalized man with poor health characterized by financial problems, lack of control, and unemployment in the family. According to Connell, the creation of adult masculinity involves active negotiation in multiple social relationships that the LTU men in our study did not seem able to undertake. Since financial responsibility for the family and the male as a breadwinner remain strong prototypes of what is still regarded as masculine, the LTU men cannot fulfil the expectations of society and live up to the standard, which can lead to the development of psychological problems. Other studies have likewise found that low control is related to psychological problems in unemployed adult men.

The possible mediating factors for the poor psychological health in LTU young women were low control and unemployed relatives. Low control has been shown to have a strong influence on different health outcomes. In a cross-sectional study of school-related health, Gillander Gådin and Hammarström found that girls were more

could also be interesting to study. A possible explanation of the association between unemployment and psychological health and smoking could be that students in the NLTU group represented a positive selection. However, a separate analysis excluding the students from the NLTU group did not show any significant change in the results. The focus of this article was on the LTU group, and a more detailed study of other groups is planned in the future.

Our study was carried out during two different phases of the business cycle in Sweden. In 1986, Sweden went through a period of high economic activity with low unemployment rates—1.6% of the total workforce and 3.7% in people under 25 years of age. There were no gender differences regarding unemployment levels. However, at the beginning of the 1990s, dramatic shifts in the trade cycle in Sweden increased the unemployment rates rapidly. In 1995, when the follow-up was performed, the total unemployment rate was 9.7% in men and 6.6% in women.

Our analysis takes its point of departure in earlier research on unemployment and ill health, showing the negative impact of unemployment on health as a result of both selection and exposure. In this paper, it could be hypothesized that different moderating factors influenced both unemployment and psychological health and smoking. We only analysed social background as a moderating factor, as the aim of this paper was to compare unemployment and health in different age groups, and there is no empirical evidence of varying moderating factors in different ages. Although there are other possible mediating factors that could be of importance for psychological health and smoking in unemployed people, we chose the most important within our theoretical framework.

It is impossible to control for all conceivable circumstances that can influence the groups. One of these is the cohort effect, which could be analysed in a societal context in this study; for instance, how the environment influenced the studied group during the whole period. The recession in the 1990s brought insecurity in the labour market, lower wages and lower unemployment compensation as well as fewer new jobs for young people, which led to increased risks of ill health. However, changes in the labour market could have had a similar impact on both LTU and NLTU people, as shown by previous research. Therefore, we will not have a profound discussion of any possible cohort effect on these two groups.
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Results from a 14-year follow-up study with a focus on psychological health and smoking

affected by lack of control than boys, and that it might also be a mediating factor for psychological symptoms. Femininities are constructed in the context of the overall subordination of women to men.23 This relationship is exemplified as a lack of control in the most powerless, for example young marginalized women.

Having unemployed relatives was also strongly related to poor psychological health in LTU young women. It has been found that young working-class unemployed women tend to feel guilty and blame themselves because they are a burden to their family. They also take responsibility for their family and friends who are affected by unemployment.27 The femininity of these young unemployed women is constructed around relational orientations that are typical for people with subordinate societal positions.28

The lack of association between long-term unemployment and poor psychological health in adult women might be explained by unsatisfactory employment that affects health to the same extent as unemployment.29 It is reasonable to believe that women in work might also be at higher risk of having psychological symptoms. Low-status occupations, wage gap, little opportunities to control the work situation, high levels of stress together with a threat of downsizing among women of all ages characterizes the current Swedish labour market.29

Social inequity research7 might explain why poor economy is so strongly associated with impaired psychological health in our study. Health status is closely related to the social position, and financial resources form an important part of this position. The gender order in society determines how the resources and control over them are allocated, resulting in more benefits for men.

Smoking

Long-term unemployment was only associated with daily cigarette smoking in young people, especially young women. Our findings are in concordance with international research showing that smoking is more associated with unemployment in young people30,31 and those from lower socio-economic classes.32,33

LTU young people have less responsibilities and meaningful activities compared with those at work or school.34 In addition, young unemployed people, in contrast to adults, tend to gather and spend a considerable time together and are therefore at greater risk of smoking under peer pressure.35 Our findings showing that unemployment is more related to psychological ill health in young people than in adults could also be an explanation of these findings. Smoking could be perceived as stress releasing, and unemployment is a stressful life event. LTU young people might seek relief in smoking,36 while adults may cope with their psychological problems by other activities.

Many health habits are established early in life,35 and it has been shown that few people start smoking in adulthood.4 Another explanation for the stronger association between long-term unemployment and smoking in young people could be a cohort effect. Moreover, cigarette smoking decreased in Sweden during the 1990s in all age groups owing to public health actions and changed fashion trends in society.16

The higher prevalence of smoking in women compared with men in our study could be discussed in terms of gender theory.23 Although the higher engagement in risk behaviours remains largely unproblematic and taken for granted in men,37 the new gender order reveals more fluid gender identities and behaviours.38 One example could be that the constructions of the dominant form of femininity in present-day Swedish society more and more legitimize acting as ‘traditional men’ with increased smoking. Young people are more sensitive to these fluctuations of gender identities and behaviours. Rather, the convergence in male and female smoking is supposed to be the byproduct of a female lag in the process of cigarette adoption.39

Our results concerning the connection between smoking habits and socio-economic position are confirmed by earlier research.32 Poor financial position is often described as the most negative effect of unemployment.19,22 Rantakeisu et al.40 have found that young women with poor economy report increased smoking after becoming unemployed. Perhaps, as Graham31 has found in financially deprived young women, smoking represents an affordable luxury and a symbol of adulthood and wealth to those who have few other opportunities for self-indulgence.

Other studies show that children from working-class families smoke more than their peers from higher-class families, which is due to a link between parental smoking and smoking in their children.41 Own social class but not parents’ social class was associated with smoking in all groups of our study, except for young men.

Conclusions

Our study has shown that the association between long-term unemployment and psychological health
as well as smoking was stronger for young people compared with adults even after controlling for potential confounders. The results highlight the need to prevent unemployment, especially in young people. There is a necessity for more research on the particular needs of each age group.

Acknowledgements

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Does the association between ill health and unemployment differ between young people and adults? Results from a 14-year follow-up study with a focus on psychological health and smoking


Available online at www.sciencedirect.com
Research article

Does transition from an unstable labour market position to permanent employment protect mental health? Results from a 14-year follow-up of school-leavers

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* Corresponding author

Abstract

**Background:** Having secure employment, in contrast to being unemployed, is regarded as an important determinant of health. Research and theories about the negative health consequences of unemployment indicated that transition from unemployment to a paid job could lead to improved health. The objective of this study was to test the hypothesis that obtaining permanent employment after being in an unstable labour market position protects mental health.

**Methods:** A 14-year follow-up of all graduates from compulsory school in an industrial town in northern Sweden was performed at ages 16, 18, 21 and 30 years. Complete data on the cohort were collected for 1044 individuals with the aid of a comprehensive questionnaire. The response rate was 96.4%. The health measurement used in this study was the psychological symptoms analysed by multivariate logistic regression. Those who obtained permanent employment were the focus of the analysis. This group consisted of people who were in an unstable labour market position for a year or more between the ages of 25 and 29, and who had acquired a permanent job one year before and at the time of the investigation.

**Results:** After controlling for gender as well as for an indicator of health-related selection, possible confounders and mediators, an association was found between the lower probability of psychological symptoms and obtaining permanent employment (OR = 0.35, 95% CI 0.19–0.63) as well as having permanent employment (OR = 0.22, 95% CI 0.10–0.51).

**Conclusion:** Our findings suggest that transition from an unstable labour market position to permanent employment could be health-promoting, even after controlling for possible confounders and mediators, as well as for an indicator of health-related selection. However, as there are few studies in the field, there is a need for more longitudinal studies in order to further analyse the relationship and to examine possible explanations. The policy implication of our study is that the transformation of unstable labour market positions into permanent employment could contribute to better public health.
Background
The importance for the health situation of having secure employment has been increasingly emphasised in new public health policies, and having a job, in contrast to being unemployed, is regarded as an important determinant of health [1,2]. A possible explanation, based mainly on research and theories about the negative health consequences of unemployment, is that transition from unemployment to a paid job improves health.

The first meta-analysis about the possible health effects of reemployment was published recently and showed improvement in mental health when unemployed persons were reemployed [3]. Other research has suggested that the positive effects of reemployment after unemployment may be limited to those who gain satisfactory new jobs [3-5]. A recent German study on health satisfaction found that even though there is a negative health effect of long-term unemployment on both men and women, reemployment has a positive effect on health satisfaction independently of the duration of the period of unemployment for both men and women [6]. Overall, research in the field is scarce.

There is more abundant research on, and agreement about, the relation between unemployment on the one hand and poor well-being and poor psychological and physical health on the other [3,6-11]. The longer the time in unemployment [3,6] and the younger the ages [3,12], the worse are the consequences to health. Different theoretical models have been used to explain the association between unemployment and health and these models can be indirectly used to explain the possible health-promoting effects of reemployment after being unemployed. The economic deprivation model assumes that unemployment leads to poverty and other forms of disadvantage, which we know are associated with poor health. Research has also shown a negative relationship between perceived financial strain and well-being during unemployment [13,14]. According to the theory of latent function, there are also non-financial benefits provided by a job, such as opportunities for social contacts and improved status (for example, that people do not look down on you) [15].

On the other hand, the health situation of the unemployed may not be improved by reemployment. A previously long-term unemployed person who is reemployed may continue to have the self-image and identity of an unemployed person (e.g. feeling that people look down on you) [16]. Moreover, insecure employment with a potential risk of unemployment could be health-imparing [17,18]. It was found that those who are permanently employed in non-preferred occupations and undesired workplaces reported more symptoms of ill-health than a comparative group [19]. Also, those who were not in preferred occupations continued to cope with job loss similarly to those who were unemployed [20].

Different models have been suggested for how a stressor may affect health over time. The model of accumulation of strain implies that strain does not go away when the stressor disappears [21]. According to the Karasek-Theorell’s demand-control model, unemployment can be regarded as a passive situation, with negative health consequences related to a combination of low control and low demands [22]. The strain of being unemployed may persist when reemployed.

Moreover, obtaining a job can be a new stressor that adds additional strain to the strain accumulated during unemployment. The combination of employment and family demands (such as having dependent children) could make reemployment after unemployment more stressful, especially for mothers who usually have the main responsibility for domestic work [23,24]. The value of having a job, commonly measured by the Work Involvement Scale [25], may also have an impact on well-being in the transition from unemployment to work [9,26]. Long-term unemployment may lead to decreased value in having a job [27-29] which can influence the reemployment process negatively.

Among demographic variables, gender was found to have interesting patterns, e.g. that it might be more difficult for women with good health to enter paid employment than men with a similar health situation [30]. Simultaneously as a meta-analysis concludes that unemployment is psychologically more damaging for women [3], it has also been found that transition from unemployment to a paid job was only associated with improved psychological well-being among women [31]. Therefore, more research is needed about the importance of gender in the transition from unemployment and other kinds of unstable labour market positions to employment.

To summarize, the question of whether transition from an unstable labour market position to permanent employment protects mental health remains to be studied.

There are several methodological inadequacies in previous research on the health consequences of reemployment. First, possible confounders in the relationship between reemployment and health need to be taken more into account. Having employed rather than unemployed relatives, especially in younger ages, might increase the possibilities of finding a job. Socio-economic status may also act as a confounder between health status and reemployment. There is overwhelming documentation of the relation between a working-class position and poor health status [32]. Also, socioeconomic status can influence
reemployment because reemployment may have more financial importance among blue-collar workers, while reemployment may mean the status of having a job among white-collar workers [33,34].

Second, most of the studies have a design that makes it impossible to control for health-related selection due to lack of information about the health status before entering the labour market. Health selection means that early health status could have an impact on adult health status [35]. Poor health before entering the labour market could lead both to difficulties in obtaining a job and to continued poor health if reemployed [3,36]. Earlier research has also shown that a history of poor health is associated with a higher risk of mobility out of employment and a lower chance of mobility into employment for both men and women [37].

Third, the labour market during the last two decades has become increasingly polarised between two extremes – “the secure centre”, characterised by permanent employees, and the “insecure periphery”, characterised by different kinds of temporary employment [38] as well as by unemployment and labour market programmes [17]. Thus, the frontier between employment and unemployment is becoming blurred and it is methodologically difficult to obtain accurate data about exposure [39]. It has therefore been suggested that studies on the labour market position should move away from the comparison between employed and unemployed towards a more dynamic comparison of workers with stable versus unstable jobs [10,39]. As young people often move between different temporary situations such as unemployment, labour market programmes, studies and precarious employments [7] the analysis of an unstable labour market position should move away from the comparison between employed and unemployed towards a more comprehensive picture of the transition to permanent employment.

Fourth, the non-response rate is often high in longitudinal studies which are necessary for analysing health changes related to labour market trajectories. A high response rate is crucial for including marginalised people who are often missing in other studies, and earlier research has shown that even a low non-response rate can introduce serious bias and uncertain results [40].

Thus, there is a strong need for longitudinal studies with high response rates, starting at a young age before the cohort enters the labour market, so that health-related selection can be controlled for.

The aim of this study was to analyse whether transition from an unstable labour market position to permanent employment could protect mental health. The hypothesis was that obtaining permanent employment after being in an unstable labour market position is associated with a lower risk of psychological symptoms after controlling for gender, possible confounders and mediators as well as an indicator of health-related selection.

Methods
The study was carried out in a medium-sized industrial town in the north of Sweden. The cohort, consisting of all 1083 pupils (506 girls and 577 boys) aged 16 who attended or should have attended the last year of compulsory school in 1981, was followed up at the ages of 16, 18, 21 and 30. Extensive work was carried out to reach every participant, including those who had moved, in order to minimize the non-response rate to a minimum [8]. Complete data for the whole 14-year follow-up period were collected for 1044 individuals (547 men and 497 women), i.e. 96.4% of the original sample.

Data were mainly collected with comprehensive questionnaires during school hours (at the ages of 16 and 18) and during class reunions (at the ages of 21 and 30). The questionnaires covered the following main themes: psychological and physical symptoms, health behaviour, experiences of work and unemployment, as well as socioeconomic data. The questionnaires, including a reminder, were sent to those who could not attend these reunions. Participants who failed to reply were contacted by telephone and, if they agreed to participate, a telephone interview was performed.

A within-subject design was used, based on three repeated measurements. The surveys from 1981 (when the respondents were 16 years old), 1986 (21 years) and 1995 (30 years) were used in this article. The method is extensively described elsewhere [35,40].

Statistics
Windows version 15.0 of SPSS was used for data analysis. We assessed the distribution of the dependent variable (health outcome) and independent variables between the three groups of labour market position for men and women separately (Tables 1a and 1b). A chi-square test was used to analyse differences for the dichotomous variables between the studied groups in Tables 1a and 1b. A p-value <0.05 was chosen as statistically significant. The correlations between all independent variables included in the analyses were calculated [see Additional file 1]. The internal consistency for all indices included in the model was measured by Cronbach’s alpha [see Additional file 2].

Sensitivity analyses were performed for both the dependent and the independent variables with ordinal scales in order to define how to dichotomise variables. Thus, different cut-off points of each specific variable were tested in
Table 1: a. Distribution of the confounders and mediating variables included in the multiple regression analyses among men without permanent employment, obtained permanent employment and in permanent employment (percentages and p-values).

<table>
<thead>
<tr>
<th></th>
<th>Without permanent employment</th>
<th>Obtained permanent employment</th>
<th>Permanent employment</th>
<th>p Without permanent employment/obtained permanent employment</th>
<th>p Without permanent employment/permanent employment</th>
<th>p Obtained permanent employment/permanent employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>n = 42</td>
<td>n = 46</td>
<td>n = 324</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dependent variable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological symptoms (age 30)</td>
<td>52.4</td>
<td>13.0</td>
<td>20.1</td>
<td>0.687</td>
<td>0.409</td>
<td>0.965</td>
</tr>
<tr>
<td>Psychological symptoms (age 16)</td>
<td>38.1</td>
<td>21.7</td>
<td>20.1</td>
<td>0.513</td>
<td>0.453</td>
<td>0.873</td>
</tr>
<tr>
<td>Unemployed at young age (16–21)</td>
<td>37.7</td>
<td>10.9</td>
<td>10.2</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>0.894</td>
</tr>
<tr>
<td>Have children (21)</td>
<td>4.8</td>
<td>2.2</td>
<td>6.8</td>
<td>0.612</td>
<td>0.605</td>
<td>0.221</td>
</tr>
<tr>
<td>Financial problems (21)</td>
<td>66.7</td>
<td>47.8</td>
<td>42.0</td>
<td>0.075</td>
<td>0.002</td>
<td>0.452</td>
</tr>
<tr>
<td>Unemployed relatives (21)</td>
<td>16.7</td>
<td>2.2</td>
<td>7.7</td>
<td>0.012</td>
<td>0.044</td>
<td>0.194</td>
</tr>
<tr>
<td>High WIS (30)</td>
<td>21.4</td>
<td>28.3</td>
<td>28.7</td>
<td>0.477</td>
<td>0.324</td>
<td>0.950</td>
</tr>
<tr>
<td>Blue-collar worker (30)</td>
<td>64.3</td>
<td>45.7</td>
<td>43.5</td>
<td>0.079</td>
<td>0.011</td>
<td>0.785</td>
</tr>
<tr>
<td>Do not have a chance to do what I would prefer to do (30)</td>
<td>66.7</td>
<td>52.2</td>
<td>48.8</td>
<td>0.172</td>
<td>0.005</td>
<td>0.286</td>
</tr>
<tr>
<td>High demands (30)</td>
<td>21.4</td>
<td>45.7</td>
<td>31.8</td>
<td>0.015</td>
<td>0.176</td>
<td>0.060</td>
</tr>
<tr>
<td>Low control (30)</td>
<td>45.2</td>
<td>32.6</td>
<td>26.2</td>
<td>0.190</td>
<td>0.011</td>
<td>0.370</td>
</tr>
<tr>
<td>Poor social network (30)</td>
<td>11.9</td>
<td>30.4</td>
<td>32.4</td>
<td>0.006</td>
<td>0.058</td>
<td>0.784</td>
</tr>
<tr>
<td>Poor social support (30)</td>
<td>42.9</td>
<td>26.1</td>
<td>22.8</td>
<td>0.005</td>
<td>0.070</td>
<td>0.633</td>
</tr>
<tr>
<td>Risk of unemployment (30)</td>
<td>81.0</td>
<td>47.8</td>
<td>25.9</td>
<td>0.001</td>
<td>&lt;0.001</td>
<td>0.002</td>
</tr>
<tr>
<td>People look down on me (30)</td>
<td>40.5</td>
<td>32.6</td>
<td>20.7</td>
<td>0.385</td>
<td>0.005</td>
<td>0.075</td>
</tr>
</tbody>
</table>

Table 1: b. Distribution of the confounders and mediating variables included in the multiple regression analyses among women without permanent employment, obtained permanent employment and in permanent employment (percentages and p-values).

<table>
<thead>
<tr>
<th></th>
<th>Without permanent employment</th>
<th>Obtained permanent employment</th>
<th>Permanent employment</th>
<th>p Without permanent employment/obtained permanent employment</th>
<th>p Without permanent employment/permanent employment</th>
<th>p Obtained permanent employment/permanent employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>n = 31</td>
<td>n = 26</td>
<td>n = 248</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dependent variable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological symptoms (age 30)</td>
<td>54.8</td>
<td>26.9</td>
<td>26.6</td>
<td>0.002</td>
<td>0.007</td>
<td>0.134</td>
</tr>
<tr>
<td>Psychological symptoms (age 16)</td>
<td>41.9</td>
<td>53.8</td>
<td>37.1</td>
<td>0.176</td>
<td>0.948</td>
<td>0.138</td>
</tr>
<tr>
<td>Unemployed at young age (16–21)</td>
<td>41.9</td>
<td>37.7</td>
<td>11.7</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>0.069</td>
</tr>
<tr>
<td>Have children (21)</td>
<td>6.5</td>
<td>3.8</td>
<td>11.7</td>
<td>0.750</td>
<td>0.371</td>
<td>0.216</td>
</tr>
<tr>
<td>Financial problems (21)</td>
<td>74.2</td>
<td>50.0</td>
<td>58.1</td>
<td>0.065</td>
<td>0.086</td>
<td>0.426</td>
</tr>
<tr>
<td>Unemployed relatives (21)</td>
<td>22.6</td>
<td>7.7</td>
<td>7.7</td>
<td>0.052</td>
<td>0.007</td>
<td>0.096</td>
</tr>
<tr>
<td>High WIS (30)</td>
<td>9.7</td>
<td>19.2</td>
<td>32.7</td>
<td>0.426</td>
<td>0.008</td>
<td>0.149</td>
</tr>
<tr>
<td>Blue-collar worker (30)</td>
<td>38.7</td>
<td>30.8</td>
<td>36.7</td>
<td>0.537</td>
<td>0.827</td>
<td>0.552</td>
</tr>
<tr>
<td>Do not have a chance to do what I would prefer to do (30)</td>
<td>58.1</td>
<td>34.6</td>
<td>44.0</td>
<td>0.077</td>
<td>0.137</td>
<td>0.363</td>
</tr>
<tr>
<td>High demands (30)</td>
<td>29.0</td>
<td>30.8</td>
<td>38.7</td>
<td>0.893</td>
<td>0.285</td>
<td>0.427</td>
</tr>
<tr>
<td>Low control (30)</td>
<td>41.9</td>
<td>38.5</td>
<td>25.4</td>
<td>0.771</td>
<td>0.054</td>
<td>0.159</td>
</tr>
<tr>
<td>Poor social network (30)</td>
<td>16.1</td>
<td>36.6</td>
<td>31.3</td>
<td>0.130</td>
<td>0.088</td>
<td>0.705</td>
</tr>
<tr>
<td>Poor social support (30)</td>
<td>29.0</td>
<td>30.8</td>
<td>30.6</td>
<td>0.888</td>
<td>0.855</td>
<td>0.990</td>
</tr>
<tr>
<td>Risk of unemployment (30)</td>
<td>83.9</td>
<td>50.0</td>
<td>29.8</td>
<td>0.005</td>
<td>&lt;0.001</td>
<td>0.003</td>
</tr>
<tr>
<td>People look down on me (30)</td>
<td>48.4</td>
<td>30.8</td>
<td>28.1</td>
<td>0.151</td>
<td>0.025</td>
<td>0.822</td>
</tr>
</tbody>
</table>
the regression analyses. In all cases the results were the same in the sensitivity analyses and then the guiding principle was to dichotomise at the 75th percentile.

In order to analyse whether the transition from an unstable labour market position to permanent employment was associated with the lower probability of having psychological symptoms, multivariate logistic regression analysis was used to estimate the odds ratio (OR) with 95% confidence intervals (CI) for the health outcome in relation to the variable "labour market position" after control for gender, possible confounders and mediators as well as for the indicator of health-related selection (Table 2). Bivariate regression analyses (not shown in the Table) were performed for the variable "labour market position" and the outcome variable in order to analyse the change in OR between the bivariate and the multivariate regression analyses. Possible interaction between gender and labour market position was assessed with multiplicative interaction.

Written consent to participate was given by the participants in the study. The Ethics Committees of Umeå and Uppsala Universities approved the study.

**Outcome variable**
The outcome variable psychological symptoms at age 30 was measured with a well-known and validated scale from the Swedish Survey of living conditions [41,42]. The scale consisted of questions about symptoms during the last year with the answer alternatives "yes" (coded as 1) or "no" (coded as 0). The index of psychological symptoms included six items on restlessness, concentration problems, nervousness, palpitations, anxiety and other nervous symptoms. The range of the index was from 0 to 6, with higher values corresponding to more psychological problems.

The proportion over the cut-off point (≥ 1) was defined as those with psychological symptoms. Those below the cut-off point (<1) were defined as not having psychological symptoms.

**Independent variables**

**Labour market position**
The variable "labour market position" was measured with a specially constructed battery of questions where the participants were asked to report how long they had been unemployed, employed, studying, and participating in labour market programmes, etc., since the last follow-up. The reports were done for each school-year term (autumn and spring) during the period between 1986 and 1995. If the information about the labour market programmes and unemployment was missing or incomplete, it was supplemented with data from the Swedish Labour Market Board’s register.

An unstable labour market position was defined as being in unemployment, occasional jobs or labour market programmes. The aim of the labour market programmes in Sweden during the 1990s was to provide the unemployed with work experience and training in the regular labour market. A "vocational training" aimed at enhancing mobility. Matching on the labour market was also a part of the labour market programmes, and provided qualified theoretical or practical education, which was either purchased from educational enterprises or the regular education system [43,44].

Since we were interested in the transition from an unstable labour market position to employment, the population was classified into three types of labour market groups. Through fulfilling the three criteria – a), b) and c), groups with the highest exposure to different kinds of labour market positions were defined.

1. Reference group (without permanent employment): a) ≥ one year of an unstable labour market position between age 25 AND 29 and b) unstable labour market position between age 25 AND 29 and c) unstable labour market position between age 25 AND 29.
for the last year prior to the investigation AND c) being in an unstable labour market position at the time of the investigation at age 30 (n = 73).

2. Obtained permanent employment: a) ≥ one year of an unstable labour market position between age 25 and 29 AND b) having permanent employment one year prior to and c) at the time of the investigation at age 30 (n = 72).

3. Constant permanent employment: a) < one year of an unstable labour market position between age 25 and 29 AND b) having permanent employment one year prior to and, AND c) having permanent employment at the time of the investigation at age 30 (n = 572).

Those who did not belong to any of these three groups were excluded from the analyses (n = 322).

The variable “labor market position” was defined independent of having part-time or full-time employment.

Other independent variables
Gender was defined as 1 = men, 0 = women. The other independent variables were defined as potential confounders (i.e. variables associated with both the dependent and the independent variables) or potential mediators (i.e. variables that interplayed between the dependent and the independent variables). Those variables that could not be defined as either confounders or mediators were defined as having an unclear role.

Indicator of health-related selection at age 16
As indicator of health-related selection we used psychological symptoms at age 16, which was measured with the same questions as those in the index of psychological symptoms at age 30 (and dichotomised in the same way).

Potential confounders at age 21
Unemployment was measured with the same battery of questions as the variable “labor market position”. Those who were without a job for at least 6 months between ages 16 and 21 were defined as unemployed at a young age (= 1).

The variable have children was measured with one question and defined as those having at least one child (= 1).

Financial problems (cash margin) was measured with one question about the possibility of obtaining a certain amount of money (corresponding to 500 euros) within a week by one’s own means, with alternative responses yes (= 0) or no (= 1).

Unemployed relatives was measured with one question (yes = 1, no = 0) about having an unemployed person in the family during the last 12 months.

Potential confounders, mediators and factors with an unclear role at age 30
Socio-economic position was measured with one question about the subject’s own occupation and defined according to the Swedish socio-economic (SEI) classification of occupational categories [45]. Blue-collar worker (or manual worker) was coded as 1 and white-collar worker (or non-manual worker) was coded as 0 (confounder).

A negative answer to the question “Do you do what you want to do?” regarding type of occupation (work, studies, unemployment etc.) was considered to reflect not having the chance to do what one would prefer to do (= 1) (possible mediator) [46].

The psychosocial need for a job was measured by the Work Involvement Scale (WIS) which was developed and validated by Warr, Cook and Wall [25]. The WIS-scale consisted of six seven-grade questions about work commitment with a range from 6 to 42. High scores indicated high work involvement. The proportion over the cut-off point was defined as high work involvement (unclear role).

Karasek-Theorell’s two dimensional model was used to construct the indices of demands and control [22] in relation to the current occupational situation (including employment, studies, unemployment, etc.). The index of high demands was measured from six questions with four answer alternatives each (giving a range of the index from 6 to 24) on qualitative and quantitative demands (referring to quantity of work, intellectual requirements, and time constraints of the job). The index of low control (referring to the possibilities of making decisions, being creative and using and developing one’s own skills) was measured in the same way as high demands. The proportion over the cut-off point was defined as those with high demands and low control correspondingly (possible mediators).

Validated questions on social network and social support indices developed by Henderson, Duncan-Jones, Byrne and Scott were used [47]. Poor social network was measured with four questions (each with six answer alternatives) about quantitative social network (range 4 to 24). Poor social support (material and emotional) was measured with six questions (four with answer alternatives) about qualitative aspects of social support (range 6 to 24). The proportion above the cut-off point was defined as those with poor social support and poor social network correspondingly (unclear role).
Risk of unemployment was measured with the question "How big is the risk that you can involuntarily become unemployed?" The question had four answer alternatives (1 = high, 4 = no risk) and was dichotomised as yes if the answer was high or some risk (= 1) and no if low or no risk (= 0) (possible mediator).

The question "People look down on me" had a 7-grade scale from disagree to completely agree [35]. The scale was dichotomised at the 75th percentile. The proportion above the cut-off point was defined as those who felt that others look down on them (= 1) (possible mediator).

Many other possible confounders, such as education and indicators of externalising problems (such as alcohol consumption and use of narcotics) could have been included in the analyses. However, due to the risk of multicollinearity the number of possible confounders had to be kept low. For example, the education variable was excluded from the model due to its high correlation with social class among women (0.480).

Results

Table 1a and 1b show the distribution of the dependent and independent variables among men and women separately in different labour market positions, i.e. among those who were without permanent employment, had obtained permanent employment and had permanent employment.

Among women, but not men, significant differences in the psychological symptoms at age 30 were found between those without permanent employment compared to those who had obtained a permanent job as well as those with permanent employment. Overall, those men (and to a lesser extent women) without permanent employment were worse off than those with permanent employment and those who had obtained a permanent job. With one exception (risk of unemployment) the situation of those who had obtained a permanent job did not differ significantly from those who had permanent employment.

Gender differences were tested within the three groups of labour market position between Tables 1a and 1b, and only found for social class among those without permanent employment, where more men than women were of low social class (p = 0.031). Among those in permanent employment, women had more often children (p = 0.024) and financial problems (p = <0.001) as well as poorer psychological health at both age 16 and 30 (p = 0.005) compared to men. Women who became permanently employed had poorer psychological health at both ages 16 and 30 than men (p = <0.001).

A separate analysis of labour market activities among those without permanent employment at age 25, i.e., during the first year of the exposure period for the variable "unstable labour market position", showed that 32 percent were unemployed, 15 percent had occasional jobs, 14 percent were in labour market programmes while the rest were in studies or in permanent employment (data not shown in the tables). As regards the excluded group, the majority had permanent jobs (62 percent), while 25 percent were studying.

The correlations between labour market position, psychological symptoms at age 16 as well as all confounders and mediators included in the model (p = <0.05) are shown in Additional file 1. The highest correlations were found between labour market position and risk of unemployment among both men (0.362) and women (0.344).

A multivariate logistic regression was performed in order to analyse whether the transition from an unstable labour market position to permanent employment was associated with psychological symptoms. The results are presented in Table 2.

The multivariate analysis showed that the odds ratio for the psychological symptoms was significantly lower in the groups obtaining permanent employment and with permanent employment, compared to the group without permanent employment. Also, psychological symptoms at age 16, not having the chance to do what one would prefer to do, high demands and "people look down on me" had strong associations with psychological symptoms at age 30.

A separate bivariate analysis was performed to analyse the association between psychological symptoms at age 30 and the variable labour market positions (data not shown in the tables). For those who obtained permanent employment the odds ratio for psychological symptoms was 0.26 (95% CI 0.16–0.43) and for those in permanent employment the odds ratio was 0.19 (95% CI 0.09–0.41). Compared with the results in Table 2, there were no major changes of the OR for permanent employment, while the OR for obtaining permanent employment diminished.

Two other indicators of health-related selection were also tested – psychological health (measured with questions identical to those used at age 16 and at age 30 and dichotomised in the same way) at age 18 and at age 21. If health-related selection was measured at 18 respectively at age 21 the OR for having lower scores of psychological symptoms at age 30 among those who obtained permanent employment was 0.34 (95% CI 0.18–0.63) respectively 0.39 (95% CI 0.21–0.74). Also, if the health-related selection was measured at 18 respectively at age 21 the OR for
having lower scores of psychological symptoms at age 30 and having permanent employment was 0.19 (95% CI 0.08–0.47) respectively 0.22 (95% CI 0.09–0.55). Similarly to age 16, there was a strong association between the presence of psychological symptoms at age 30 and the indicators of health-related selection at age 18 (OR = 1.35, 95% CI 1.21–1.51) and age 21 (OR = 1.36; 95% CI 1.24–1.50).

Multiplicative interaction analysis was run in order to test for interactions between gender and labour market position. No significant interaction effects were found, even when controlled for all other independent variables in the model.

Other possible confounders (education, alcohol consumption, smoking, use of narcotics) were also tested to be included in the multivariate regression analyses. None of them changed the significant association between psychological symptoms and labour market status.

The model Chi-square was significant at p = <0.001 ($\chi^2 = 112.02$, df = 17). The explained variance in the regression models, calculated by Cox & Snell R Square, was 0.14.

Discussion
The results showed that even after controlling for all the independent variables, including the indicator of health-related selection, a positive association was found between obtaining permanent employment after an unstable labour market position and a lower probability of having psychological symptoms.

On the method
The attrition rate in this study was as low as 3.6 per cent, which may be due to both the Swedish system of personal identification numbers, which makes it possible to find the address of almost anyone who lives in the country, and the fact that much effort had been expended to find even those who are usually left out in other studies [40].

Structural changes in the labour market in Sweden, including increasing unemployment and increasing work demands in all sectors, took place in the mid 1990s. Thus, we could assume that those who gained permanent employment during these conditions might be positively health-selected into employment. Those who remained unemployed could be selected out of the labour market due to poor health. However, the longitudinal design of the study made it possible to control for the health-related selection, i.e. the health situation at age 16 before entry into the labour market.

Several possible limitations of our study need to be discussed. A problem when analysing indicators of health-related selection is which time is best for measuring it. At age 16 the cohort participants were still in compulsory school and thus had not yet been exposed to the labour market. But the late teenage years and early adulthood is the period of greatest risk for the onset of affective disorders and therefore it might have been more appropriate to use health at the age of 18 or 21. However, at those ages the cohort had already been exposed to the labour market which could have affected their health status. For example, half of the cohort had experienced unemployment at age 21 and earlier research has shown the negative health consequences of unemployment already at an early age such as 18 [48] and 21 [7,8,27]. We tested health-related selection also at the ages of 18 and 21, but the lower probability of psychological symptoms among those who had obtained permanent employment and among those having permanent employment remained at both ages 18 and 21. Thus, we chose to consider health at age 16 as the main measure of health-related selection.

As young people are generally healthy, the probability is low that medical diagnoses will appear as a consequence of an unstable labour market position. Therefore, it seemed accurate to use self-reported symptoms. Moreover, it was shown that self-reported symptoms are predictive of future medical diagnosis [49]. Due to the young age of the cohort, the number of persons with high scores in the measure of psychological symptoms is small, and the cut-off point for psychological symptoms was set at the 75th percentile in order to detect a group at risk.

Another possible limitation of our study is the dichotomisation of the variable psychological symptoms at age 16. The reason for dichotomisation of the variable was that it should be measured in the same way as the identically measured outcome variable (i.e., psychological symptoms at age 30) which had to be dichotomised in the logistic regression analyses. Moreover, separate analyses showed that the association between lower scores of psychological symptoms at age 30 and obtaining permanent employment as well as having permanent employment remained significant even if the indicator of health-related selection variable was used as a continuous variable.

A further limitation is that the labour market position variable was measured from age 25, but we have no measure of the health situation or life circumstances at this age. The health of the cohort was measured with quite long intervals (age 16, age 18, age 21 and age 30). Therefore, the discussion of possible confounders in our study has to be hypothetical. The problem of attributing psychological health at age 30 to changes in the labour market position during a relatively long time period has been addressed by limiting the time period of the labour market position to...
five years (from age 25 until age 29) rather than to ten years.

In Sweden the trial period for obtaining permanent employment is six months. Therefore, among those who obtained employment, one year of permanent paid work was considered to be a valid measure of firm establishment in the labour market.

A question that needs to be raised is whether the group ‘without permanent employment’ mainly consisted of unemployed. If so, our study would not contribute to the already existing evidence on reemployment after unemployment and health. However, the group did not consist mainly of the unemployed, but had an unstable labour market position in a broader perspective.

The multivariate analysis presented in this study was controlled for some important confounders. Nevertheless, there are other possible confounders which were tested (such as level of education, substance use and other indicators of externalising problems) that may influence one’s psychological health during this time period. None of them changed the significant association between psychological symptoms and labour market status. In addition, the number of independent variables must be kept low in order to decrease the risk of mass significance. The importance of unemployment and social exclusion for health has also been more and more emphasised, for example in the WHO Commission of Social Determinants of Health [50]. Labour market position has been shown to be a key determinant of health [2,50,51]. Our findings regarding the importance of labour market programmes for health are in accordance with those statements, even though it is never possible to take all possible confounders into account.

The multivariate analysis model was tested separately for men and women, which gave similar results, indicating that obtaining employment was important to both men and women. Therefore, in order to increase the power and avoid the risk of Type II errors due to a small number of subjects in the subgroups, we chose to adjust for gender in the multivariate analysis.

On the results
In relation to psychological symptoms we confirmed our hypothesis that reemployment after being in an unstable labour market position was associated with a lower probability of having psychological symptoms. Thus, our study indicated that the transition from an unstable labour market position into permanent paid work seemed to improve psychological health among both men and women. This trend is also found in some of the other available studies in the field [3,5,6]. A longitudinal study of the German population shows that reemployment has a positive effect on health satisfaction for both men and women [6].

Of the analysed possible confounders, we did not find any significant association with psychological symptoms in the multivariate regression. Our results are supported by a German study of reemployment [6] where none of the included confounders, except having children among women, was found to have an effect on the dependent variable (health satisfaction).

Overall, the association between obtaining permanent employment and psychological symptoms was not influenced substantially by including the possible mediators in the multivariate analyses. However, three possible mediators seemed to be related to the dependent variable.

The strong association between health outcome and inability to do what a person wanted could be explained by the fact that people in unstable labour market positions may be expected to take any available job. Moreover, studies on labour market conditions indicate the negative health effects of being “locked-in” at non-preferred and undesired work [19].

The multivariate analysis showed strong association between high demands and the psychological symptoms. High demands in a newly obtained job can be a new stressor that adds additional strain to the strain accumulated during unemployment. From a theoretical point of view our results may be interpreted as if the high demands related to getting permanent employment among men were worse than the exposure to strain in an unstable labour market position. This finding is in concordance with another Swedish study indicating that the psychosocial work environment could be worse in permanent jobs than in temporary jobs, especially with regard to higher demands and more stress [17]. However, our study could not verify that the other variable in the strain model – low control, was related to the outcome variable [21].

In accordance with the theory of latent functions [15], obtaining permanent employment could lead not only to a better economic situation but also to improved self-esteem. However, the association between the psychological symptoms and a feeling of being looked down upon suggests that this may not be the case. On the other hand, those who obtained permanent employment did not report significantly higher experience of being looked down upon than those in permanent employment (Tables 1a and 1b). It seemed that the studied measure of self-esteem might operate in other contextual situations rather than in obtaining a job.
Earlier research gives strong evidence for associations between risk of unemployment and psychological symptoms [38]. In our multivariate analyses there was no association between risk of unemployment and psychological symptoms. However, most earlier studies have not controlled for confounders [38]. The lack of associations in our study could also depend on the correlations between risk of unemployment and the variable labour market positions.

Conclusion
The transition from an unstable labour market position to permanent employment seemed to be health-promoting, even after controlling for possible confounders and mediators as well as an indicator of health-related selection. Our results, therefore, suggest that there might be more complex underlying mechanisms that influence the well-being of those who had obtained employment. However, as there are few studies in the field there is a need for more longitudinal studies in order to further analyse the relationship as well as possible explanations. The policy implication of our study is that transformation of unstable labour market positions into permanent employment could contribute to better public health.

Competing interests
The authors declare that they have no competing interests.

Authors’ contributions
IR conceived the paper topic, performed the data analyses and drafted the manuscript. MN participated in the revision of the article. AH designed and coordinated the study and revised the manuscript. All authors have read and approved the final version of the manuscript.

Acknowledgements
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References


Additional file 1. Correlations between the variables labour market position, health–related selection, possible confounders and mediators among men (below the empty cells and italics) and women (above the empty cells).

<table>
<thead>
<tr>
<th>Construct</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>10</th>
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<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
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</thead>
<tbody>
<tr>
<td>1. Labour market position (25–30)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>2. Presence of psychological symptoms (16)</td>
<td>0.120*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3. Unemployed at young age (16–21)</td>
<td>0.204**</td>
<td>0.049</td>
<td></td>
<td>0.086</td>
<td>0.224**</td>
<td>-0.036</td>
<td>0.267**</td>
<td>0.053</td>
<td>-0.063</td>
<td>-0.087</td>
<td>0.175**</td>
<td>-0.193**</td>
<td>0.040</td>
<td>0.093*</td>
<td>0.089*</td>
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<tr>
<td>4. Have children (21)</td>
<td>-0.045</td>
<td>-0.049</td>
<td>0.112**</td>
<td></td>
<td>0.124**</td>
<td>0.003</td>
<td>0.213**</td>
<td>0.102*</td>
<td>0.013</td>
<td>0.056</td>
<td>0.119*</td>
<td>-0.051</td>
<td>0.181**</td>
<td>0.093*</td>
<td>-0.004</td>
</tr>
<tr>
<td>5. Financial problems (21)</td>
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<td>0.029</td>
<td>0.160**</td>
<td>0.144**</td>
<td></td>
<td>0.022</td>
<td>0.169**</td>
<td>0.133**</td>
<td>0.013</td>
<td>0.056</td>
<td>0.119*</td>
<td>-0.051</td>
<td>0.011</td>
<td>0.029</td>
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<tr>
<td>6. Unemployed relatives (21)</td>
<td>0.063</td>
<td>0.003</td>
<td>0.073</td>
<td>-0.041</td>
<td>0.001</td>
<td></td>
<td>0.047</td>
<td>0.025</td>
<td>-0.014</td>
<td>-0.030</td>
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<td>-0.014</td>
<td>-0.002</td>
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<tr>
<td>7. Blue-collar worker (30)</td>
<td>0.115*</td>
<td>0.024</td>
<td>0.182**</td>
<td>0.079</td>
<td>0.159**</td>
<td>0.141**</td>
<td></td>
<td>0.233**</td>
<td>-0.003</td>
<td>0.035</td>
<td>0.288**</td>
<td>-0.140**</td>
<td>-0.007</td>
<td>0.145</td>
<td>0.093*</td>
</tr>
<tr>
<td>8. Do not do what I want to (30)</td>
<td>0.141**</td>
<td>0.147**</td>
<td>0.097*</td>
<td>-0.045</td>
<td>0.085*</td>
<td>0.097*</td>
<td>0.229**</td>
<td>-0.140**</td>
<td>0.077</td>
<td>0.329**</td>
<td>-0.155**</td>
<td>0.177</td>
<td>0.167**</td>
<td>0.191**</td>
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</tr>
<tr>
<td>9. High WIS (30)</td>
<td>-0.175**</td>
<td>-0.035</td>
<td>-0.140**</td>
<td>-0.110*</td>
<td>-0.031</td>
<td>0.229**</td>
<td>-0.084*</td>
<td>-0.090*</td>
<td>0.116**</td>
<td>0.129**</td>
<td>0.097*</td>
<td>-0.105*</td>
<td>-0.025</td>
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</tr>
<tr>
<td>10. High demands (30)</td>
<td>-0.177**</td>
<td>0.053</td>
<td>-0.112*</td>
<td>-0.008</td>
<td>-0.053</td>
<td>-0.036</td>
<td>-0.162**</td>
<td>-0.015</td>
<td>0.113**</td>
<td>0.038</td>
<td>0.075</td>
<td>-0.115*</td>
<td>-0.029</td>
<td>0.083</td>
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</tr>
<tr>
<td>11. Low control (30)</td>
<td>0.147**</td>
<td>0.053</td>
<td>0.168**</td>
<td>-0.022</td>
<td>0.125**</td>
<td>0.109*</td>
<td>0.424**</td>
<td>0.318**</td>
<td>-0.072</td>
<td>-0.136**</td>
<td>-0.243</td>
<td>0.185**</td>
<td>0.158**</td>
<td>0.256**</td>
<td></td>
</tr>
<tr>
<td>12. Poor social network (30)</td>
<td>-0.130**</td>
<td>-0.079</td>
<td>-0.064</td>
<td>0.017</td>
<td>-0.0090*</td>
<td>-0.015</td>
<td>-0.078</td>
<td>-0.132**</td>
<td>0.034</td>
<td>0.127**</td>
<td>-0.117**</td>
<td>-0.380*</td>
<td>-0.170**</td>
<td>-0.154</td>
<td></td>
</tr>
<tr>
<td>13. Poor social support (30)</td>
<td>0.185**</td>
<td>0.049</td>
<td>0.144**</td>
<td>-0.020</td>
<td>0.103*</td>
<td>0.087</td>
<td>0.045</td>
<td>0.192**</td>
<td>-0.047</td>
<td>-0.130**</td>
<td>0.252**</td>
<td>-0.358**</td>
<td>0.047</td>
<td>0.246**</td>
<td></td>
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<tr>
<td>14. Risk of unemployment (30)</td>
<td>0.362**</td>
<td>0.149**</td>
<td>0.219</td>
<td>0.005</td>
<td>0.080</td>
<td>-0.018</td>
<td>0.152**</td>
<td>0.167**</td>
<td>-0.033</td>
<td>-0.084</td>
<td>0.160**</td>
<td>0.156**</td>
<td>0.175**</td>
<td>0.254**</td>
<td></td>
</tr>
<tr>
<td>15. People look down on me (30)</td>
<td>0.156**</td>
<td>0.110*</td>
<td>0.182**</td>
<td>-0.004</td>
<td>0.099*</td>
<td>0.039</td>
<td>0.130**</td>
<td>0.180**</td>
<td>-0.057</td>
<td>0.020</td>
<td>0.245</td>
<td>-0.194**</td>
<td>0.145</td>
<td>0.248**</td>
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</tr>
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</table>

** P-value <0.01
* P-value <0.05
Additional file 2. The internal consistency for all indices included in the model measured by Cronbach’s alpha (\(\alpha\)).

<table>
<thead>
<tr>
<th>Index</th>
<th>(\alpha)</th>
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</thead>
<tbody>
<tr>
<td>Presence of psychological symptoms (16)</td>
<td>0.83</td>
</tr>
<tr>
<td>Presence of psychological symptoms (30)</td>
<td>0.78</td>
</tr>
<tr>
<td>High WIS (30)</td>
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<tr>
<td>High demands (30)</td>
<td>0.76</td>
</tr>
<tr>
<td>Low control (30)</td>
<td>0.53</td>
</tr>
<tr>
<td>Poor social network (30)</td>
<td>0.78</td>
</tr>
<tr>
<td>Poor social support (30)</td>
<td>0.66</td>
</tr>
</tbody>
</table>
Is participation in labour market programmes related to mental health?
Results from a 14-year follow-up of the Northern Swedish Cohort.

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ABSTRACT

AIMS: There is a lack of empirical studies assessing the possible impact of active labour market programmes (ALMP) on health. The aim of the study was to analyse whether participation in ALMP, in contrast to being unemployed and not participating in ALMP (UNALMP), was related to mental health at different ages.

METHODS: The study was carried out in a medium-sized industrial town in the north of Sweden. The cohort, consisting of all 1083 pupils who attended or should have attended the last year of compulsory school in 1981, was followed-up at the ages of 16, 18, 21 and 30. Data on 381 individuals at age 21, and 133 at age 30 were used in the study. The main health measurement was psychological symptoms among participants of ALMP in contrast to UNALMP at ages 21 and 30, and was analysed by propensity score matching method (PSM) and multivariate logistic regression.

RESULTS: Generally, psychological symptoms among ALMP and UNALMP did not differ significantly. Due to methodological shortages our results that participation in ALMP was not related to psychological symptoms have to be interpreted with caution. Adjustment for either all background selection variables or the propensity score in multivariate logistic regression showed similar associations suggesting that propensity score could be used to adjust for background selection variables.

CONCLUSIONS: There is a need for more well-designed studies, using a theoretical framework, within the field.

Key words: gender, age, longitudinal, propensity score

Word count: 3200
INTRODUCTION

In the wake of the recent economic downturn in the late 2000s, it seems as if unemployment is arising to become one of the biggest problems facing industrial states. In most of these countries, the unemployed are the targets of government policies. For example, in Sweden, relatively generous unemployment benefits are combined with an active labour market policy. These measures are designed to activate and increase the competitiveness of the unemployed. Analyses of the efficiency of labour market policies have been the main focus of labour market intervention studies [1] and they showed ambiguous results. However, improvements in health are rarely among the explicit goals of active labour market programmes (ALMP) [2]; thus there is a lack of empirical studies assessing the impact of these programmes on health.

It has been shown that unemployment is associated with ill-health [3] which may be due to the fact that exposure to unemployment leads to deteriorated health or selection of those with poor health into unemployment [4-9]. Therefore, research on unemployment and health needs to control for health-related selection. Participation in ALMP, in contrast to being unemployed, might have a positive effect on health by increasing an individual’s self-esteem and confidence for the future [2]. According to the Deprivation theory [10], employment might be expected to provide not only financial but also psychological needs through imposing a time structure on the working day, providing social contact, involving people in shared goals, giving identity and enforcing activity. Strand’s [11] extension of this theory suggests that participation in ALMP could fulfil these psychological needs and thus be related to increased subjective well-being. In line with these theoretical assumptions, earlier research has shown that participation in ALMP was associated with lowered risk for suicide [12].

However, the results from various studies are not convincingly showing a relationship between ALMP and psychological health. For example, it was found that there is a lack of general positive impact on psychological health among those involved in ALMP [11], and inability to cope with the labour market project can contribute to more psychological problems [2]. The Northern Swedish Cohort demonstrated that ALMP was related to psychological symptoms in young women but not in young men [13]. The results can be compared with an evaluation of Swedish Youth Labour Market programs, which indicated that the programs were slightly better for women than for men in the age group 20-24 in terms of employment probability, while no sex differences were found in relation to earning [14].

Swedish ALMP were created during the times when men constituted the major part of the workforce and was based on an unchallenged concept of a man as the breadwinner for the family. Therefore, it is reasonable to suggest that ALMP might be most appropriate for men in a distinctively gender-segregated labour market. Different ALMP have been offered to young and adults. Until the early 1980s there were no programmes targeted at youth. Swedish ALMP explicitly for young people - youth teams, were introduced
in 1984 [15]. ALMP for young people (aged 16-20) have changed continuously during the 1980s. After the age of 20 the young people are directed to ALMP for adults administered by the Public Employment Services. The aim of the adult ALMP in Sweden during the 1990s was to provide the unemployed with work experience and training in the regular labour market. The vocational training aimed at enhancing mobility into the labour market. Matching on the labour market was also a part of the ALMP, which led to the development of qualified theoretical or practical education that was either purchased from educational enterprises or the regular education system[11, 16].

We do not have sufficient knowledge about the factors predisposing participation in ALMP. However, several predictors of unemployment have been pointed out by European and American research – low self-control, especially aggression [4], lack of the skills and qualifications required in the school and disadvantageous family background [17]. Specific personality factors like high scores of anxiety and passivity among women and emotional instability and shyness among men may also predispose to unemployment [17, 18].

**AIM**
The aim of the study was to analyse whether participation in ALMP, in contrast to being unemployed and not participating in ALMP (UNALMP), was related to mental health at different ages.

**POPULATION AND METHOD**

**Study population**
The cohort consisted of all 1083 pupils (506 girls and 577 boys) aged 16 who attended or should have attended the last year of compulsory school in 1981. Extensive work was carried out to reach every participant, including those who had moved, in order to reduce the non-response rate at follow-up to a minimum [19]. Complete data for the whole 14-year follow-up period were collected for 1044 individuals (547 men and 497 women), i.e. 96.4% of the original sample. Data were mainly collected with comprehensive questionnaires during school hours (for ages 16 and 18) and during class reunions (for ages 21 and 30). Two samples (n=381 at age 21, n=135 at age 30) with high exposure of labour market programmes were selected for this study as described below.

Personal interviews, based on of 35 questions [20], were performed by the project leader (AH) for each individual pupil at age 16 with all teachers (n=6) who were responsible for the class during the last three years of compulsory school. The method is extensively described elsewhere [7, 21].

**Performance**
The study was carried out in Luleå - a medium-sized industrial town in the north of Sweden. The cohort was followed with extensive questionnaires in 1981 (when the respondents were 16 years old), 1983 (18 years),
1986 (21 years) and 1995 (30 years). The questions were derived from well-known and validated questionnaires [22-24] and covered the following main themes: psychological and physical symptoms, health behaviour, experiences of work and unemployment as well as socio-economic data. Analyses were performed on men and women separately as previous studies on this cohort have shown different associations for both genders as regards to ill-health and labour market status [25, 26].

Measures of labour market position between age 16 and age 30
The data on the length of labour market activities was taken from a question about the total length in labour market activities since the last follow-up.

The following main exposure groups were defined:

Age groups 18-21 (young)
ALMP – participants in active labour market programmes, dichotomised at the 75th percentile of the total time in ALMP during the three year period. The cut-off point was 36 weeks;
UNALMP – unemployed and not participating in ALMP, dichotomised at the 75th percentile of the total time in unemployment during the three year period. The cut-off point for young men and women was 12 weeks.

Age groups 22-30 (adults)
ALMP – participants in active labour market programmes, the dichotomisation of the total time in ALMP during the nine year period was performed as close as possible to the 75th percentile (at the 81st percentile), with a cut-off point of 4 weeks;
UNALMP - unemployed and not participating in ALMP, dichotomised at the 75th percentile of the total time in unemployment during the nine year period. The cut-off point was 60 weeks.

Health outcome at ages 21 and 30
Psychological symptoms was measured with a scale previously used in Scandinavian research [27]. The question about having nervous problems during the last year at ages 21 and 30 consisted of six items on restlessness, concentration problems, nervousness, palpitations, anxiety and other symptoms. The range of the index was from 0 to 5, with higher values corresponding to more psychological problems. The internal consistency, measured by Cronbach’s alpha, was 0.71 and 0.78 correspondingly. Sensitivity analyses were performed for each age in order to define how to dichotomise the psychological health variables with ordinal scales. Different cut-off points were tested in the regression analyses. In all analyses, the results were the same and then the guiding principle was to dichotomise at the 75th percentile according to earlier research [28]. Thus, the proportion over the cut-off point (≥ 1) was defined as those with psychological symptoms. Those below the cut-off point (< 1) were defined as not having psychological symptoms.
Background variables at age 16

In total 44 background variables (see Appendix) - including items from the pupil’s and the teacher’s questionnaires – were tested in stepwise logistic regression. With two exceptions (the indicator of health-related selection, as well as social class of origin) only variables that remained significant in the final step of a stepwise logistic regression for each age group separately were included in the model.

Pupil’s questionnaire

Psychological symptoms at age 16 was measured and dichotomised in the same way as at ages 21 and 30, and was used as an indicator of health-related selection (Cronbach’s alpha 0.83).

Parents' social class was used as an indicator of social background. The pupil was considered to be of working class origin if father or mother (=1) or both (=2) were manual workers.

Confounders at ages 21 and 30

A question about the present situation at the labour market at the ages 21 and 30 was used to define different levels of labour market attachment: paid work, studies, unemployment, ALMP, military service, parental leave, etc.

Level of education was measured with a question about having secondary school education (=0) or not (=1) at ages 21 and 30. Socio-economic position was measured with one question about the subject’s own occupation at ages 21 and 30 and defined as blue-collar occupation (or manual worker) coded as 1, and white-collar occupation (or non-manual worker or university student) coded as 0. Financial position at ages 21 and 30 was measured with one question about the possibility of obtaining a certain amount of money within a week by one’s own means, with alternative responses yes (=0) or no (=1).

Statistical analysis

Windows versions 15.0 of SPSS and 10.0 of STATA were used for data analysis. We assessed the distribution of the health outcome variables, i.e. the presence of psychological symptoms (Table 1) and a chi-square test was used to analyse differences between the ALMP and UNALMP in Table 1. A p-value <0.05 was chosen as statistically significant.

Logistic regression is a common method for adjustment for background variables to avoid possible confounding bias. However, this method has several limitations. It takes into consideration only measured confounders; most investigators seek to construct regression models using as few covariates as possible to predict the outcome and interaction and nonlinear terms are rarely added [29]. Another method attempting to evade these difficulties is “propensity scores” developed by Rosenbaum & Rubin [30]. Propensity score is a
measure indicating that each individual has a probability to belong to a particular group, namely ALMP or UNALMP. In our study, unemployed persons were not randomly assigned to “treatment” (participation in ALMP versus remaining unemployed) as would have happened in a randomized controlled trial. In order to control for the confounders before the start of the “treatment” with labour market programmes, background variables at age 16 that could have later affected both the health status at ages, 21 and 30, respectively, as well as the labour market position were identified. On step one a large number of demographic, family, health and social characteristics as well as data from the teachers’ interviews (see the Appendix) that could possibly influence the difference in the association with health between treated (ALMP) and untreated (UNALMP) were tested. With two exceptions (the indicator of health-related selection, as well as social class of origin) only discriminants (see indication in the Appendix) that remained significant in the final step of the stepwise logistic regression for each age group separately were included in the model.

On step two we summarised all relevant information into one score by performing logistic regression analyses. The propensity score was then calculated as the estimated probability that an individual would have been treated based on that individual’s observed pre-treatment variables [31]. Thus, we were able to control for systematic background differences in the characteristics of people who had or had not been involved in ALMP. To compute the average treatment effect of the treated accurately, the ALMP and UNALMP groups should be matched precisely on the basis of the propensity score (PSM). In practice, it is never possible to match the scores precisely; therefore we used the nearest neighbour matching method which in previous research has been suggested to be appropriate [32]. The stratification estimator repeats all the steps used in the estimation of the propensity score. On step three matching pairs that had the same propensity score where identified and analysed in relation to health outcome at ages 21 and 30 (Tables 2 and 3).

In order to analyse whether participation in ALMP was associated with the lower probability of having psychological symptoms, multivariate logistic regression analysis was used to estimate the odds ratio (OR) with 95% confidence intervals (CI) for the health outcome in relation to the ALMP after controlling for background selection and other confounding variables (Table 4).

The Ethics Committees of Umeå and Uppsala Universities approved the study.

RESULTS
The distribution of the presence of psychological symptoms among participants of labour market programmes (ALMP) and those being unemployed (UNALMP) at ages 21 and 30 is presented in Table 1. No significant differences were found between ALMP and UNALMP, in men and women.
The effect of participation in ALMP on having psychological symptoms is presented in Tables 2 and 3. Each estimated effect is reported in absolute terms as average psychological symptoms score; included are differences in the psychological symptoms scores, standard errors and confidence intervals. By presenting the absolute size of the effects, it is possible to compare the magnitude of the effects between the treated (ALMP) and untreated (UNALMP). In addition, we have displayed both the unmatched and matched samples in order to show how the effect changed after propensity score matching (PSM). Participation in ALMP had no statistically significant effect on health in any age group.

Table 2. Nearest neighbour estimates of the average effect of ALMP compared to UNALMP in the age group 18-21 on mental health at age 21 (unmatched and matched with PSM).

<table>
<thead>
<tr>
<th></th>
<th>The effect</th>
<th>Difference (S.E.)</th>
<th>95% CI</th>
<th>Number of observations</th>
</tr>
</thead>
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<tr>
<td></td>
<td>ALMP</td>
<td>UNALMP</td>
<td></td>
<td>ALMP</td>
</tr>
<tr>
<td><strong>Full sample</strong></td>
<td></td>
<td></td>
<td></td>
<td>257</td>
</tr>
<tr>
<td>(unmatched)</td>
<td>0.29</td>
<td>0.31</td>
<td>-0.02 (0.05)</td>
<td>-</td>
</tr>
<tr>
<td>(matched)</td>
<td>0.29</td>
<td>0.28</td>
<td>0.02 (0.07)</td>
<td>-0.09, 0.18</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
<td>109</td>
</tr>
<tr>
<td>(unmatched)</td>
<td>0.29</td>
<td>0.24</td>
<td>0.05 (0.07)</td>
<td>-</td>
</tr>
<tr>
<td>(matched)</td>
<td>0.24</td>
<td>0.19</td>
<td>0.04 (0.12)</td>
<td>-0.13, 0.36</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td></td>
<td></td>
<td></td>
<td>148</td>
</tr>
<tr>
<td>(unmatched)</td>
<td>0.28</td>
<td>0.40</td>
<td>-0.12 (0.07)</td>
<td>-</td>
</tr>
<tr>
<td>(matched)</td>
<td>0.29</td>
<td>0.35</td>
<td>-0.11 (0.11)</td>
<td>-0.38, 0.08</td>
</tr>
</tbody>
</table>

Note: The effect, difference, standard errors (S.E.) calculated by bootstrap method (1000 replications) in parenthesis, 95% bias corrected confidence interval (CI).
Table 3. Nearest neighbour estimates of the average effect of ALMP compared to UNALMP in the age group 21-30 on mental health at age 30 (unmatched and matched with PSM).

<table>
<thead>
<tr>
<th></th>
<th>The effect</th>
<th>Difference (S.E.)</th>
<th>95% CI</th>
<th>Number of observations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ALMP</td>
<td>UNALMP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full sample</td>
<td>0.32</td>
<td>0.29</td>
<td>0.03 (0.08)</td>
<td>-</td>
</tr>
<tr>
<td>(unmatched)</td>
<td></td>
<td></td>
<td></td>
<td>66</td>
</tr>
<tr>
<td>(matched)</td>
<td>0.22</td>
<td>0.35</td>
<td>-0.13 (0.26)</td>
<td>-0.75, 0.33</td>
</tr>
<tr>
<td>Men</td>
<td>0.33</td>
<td>0.24</td>
<td>0.09 (0.10)</td>
<td>-</td>
</tr>
<tr>
<td>(unmatched)</td>
<td></td>
<td></td>
<td></td>
<td>42</td>
</tr>
<tr>
<td>(matched)</td>
<td>0.60</td>
<td>0.40</td>
<td>0.20 (0.31)</td>
<td>0, 1</td>
</tr>
<tr>
<td>Women</td>
<td>0.29</td>
<td>0.36</td>
<td>-0.06 (0.13)</td>
<td>-</td>
</tr>
<tr>
<td>(unmatched)</td>
<td></td>
<td></td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>(matched)</td>
<td>0</td>
<td>1</td>
<td>-1 (0)</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: The effect, difference, standard errors (S.E.) calculated by bootstrap method (1000 replications) in parenthesis, 95% bias corrected confidence interval (CI).

Table 4 shows the associations of participation in ALMP and the presence of psychological symptoms at different ages using multivariate model, adjusted for background selection variables, propensity score, confounders, and propensity score and confounders together at ages 21 and 30 for the full sample, men and women. The results showed that neither for the full sample, nor for men or women separately any significant associations between ALMP and ill-health were found except for men at age 21 when adjustment for the confounders at age 21 was made. Adjustment for either all background selection variables (Model 2) or propensity score (Model 3) did not change the association between ALMP and psychological symptoms.
### Table 4. Comparison of the association between participation in active labour market programmes (ALMP) and psychological symptoms using multivariate logistic regression model, adjusted for background selection variables, propensity score, confounders, and propensity score and confounders together at ages 21 and 30 for full sample, men and women; OR; 95% CI.

<table>
<thead>
<tr>
<th></th>
<th>AGE 21 OR (95% CI)</th>
<th>AGE 30 OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model 1: Crude model</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Full sample</strong></td>
<td>0.70 (0.45-1.10)</td>
<td>0.75 (0.38-1.49)</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td>0.67 (0.56-1.25)</td>
<td>0.79 (0.33-1.89)</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td>0.73 (0.38-1.40)</td>
<td>0.71 (0.24-2.14)</td>
</tr>
<tr>
<td><strong>Model 2: Adjusted for background selection variables at age 16</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Full sample</strong></td>
<td>0.74 (0.47-1.18)</td>
<td>0.69 (0.31-1.52)</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td>0.78 (0.39-1.54)</td>
<td>0.50 (0.12-2.01)</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td>0.71 (0.37-1.38)</td>
<td>0.70 (0.33-1.50)</td>
</tr>
<tr>
<td><strong>Model 3: Adjusted for propensity score at age 16</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Full sample</strong></td>
<td>0.73 (0.46-1.18)</td>
<td>0.70 (0.33-1.50)</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td>0.73 (0.38-1.40)</td>
<td>0.83 (0.31-2.19)</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td>0.73 (0.38-1.39)</td>
<td>0.50 (0.14-1.81)</td>
</tr>
<tr>
<td><strong>Model 4: Adjusted for confounders</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Full sample</strong></td>
<td>0.70 (0.44-1.09)</td>
<td>0.81 (0.38-1.73)</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td>0.77 (0.38-1.56)</td>
<td>0.38 (0.09-1.59)</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td>0.70 (0.36-1.19)</td>
<td>0.54 (0.12-2.43)</td>
</tr>
<tr>
<td><strong>Model 5: Adjusted for background selection variables at age 16 and confounders</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Full sample</strong></td>
<td>0.74 (0.46-1.17)</td>
<td>0.65 (0.27-1.56)</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td>0.65 (0.34-1.24)</td>
<td>0.61 (0.21-1.81)</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td>0.73 (0.38-1.42)</td>
<td>0.79 (0.24-2.60)</td>
</tr>
<tr>
<td><strong>Model 6: Adjusted for propensity score at age 16 and confounders</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Full sample</strong></td>
<td>0.71 (0.45-1.12)</td>
<td>0.69 (0.29-1.61)</td>
</tr>
<tr>
<td><strong>Men</strong></td>
<td>0.71 (0.37-1.38)</td>
<td>0.42 (0.10-1.80)</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td>0.72 (0.37-1.40)</td>
<td>0.58 (0.18-1.93)</td>
</tr>
</tbody>
</table>

**Note:** 1 All background selection variables at age 16, 2 propensity score of the background selection variables at age 16, 3 adjusted for the present situation at the labour market, level of education, social class and financial position at ages 21 and 30.

### DISCUSSION

Overall, no associations between participation in ALMP and psychological symptoms were found in any age group.

**On the method**

The present study contributes to the research field in several ways. First, the relation between ALMP and psychological symptoms is analysed in relation to age, gender and exposure to unemployment. Second, it applies the PSM method, which is a relatively new approach to adjust the model for a large number of
background variables. Third, the design of our study makes it possible to control for indicators of health-related selection. Most studies employ a design that makes it impossible to control for background selection due to lack of information about the situation before entering the labour market. Another strength of the present study was the high response rate which decreases the risk for bias in relation to non-responders [33].

The adjustment for background factors performed either as logistic regression (Model 2 in Table 4) or the PSM (Model 3 in Table 4) gave similar associations. This was in concordance with the results from a review by Shah and colleagues [29] which show that in the measures of the of association between exposure and outcome, propensity score methods do not often give different results from traditional regression models. Thus, we considered that the PSM might be useful in analyses where the number of variables included in the model should be kept low.

One possible limitation, however is, that although we considered around fifty background factors, there might still be numerous measurable and non-measurable variables that might be related to mental health due to the heterogeneity of the groups studied [34].

The main methodological problem concerns the short exposure to ALMP. We used the 75th percentile in order to get a highly exposed group, but still the total time in ALMP was quite short. Also, there was a lack of information about the exact timing of the measures. The possible health effects at for example age 30 may of course differ depending on if you are exposed to ALMP at age 22 or at age 29. This relates to another methodological problem – the relatively long time between the follow-ups. Ideally, studies designed to analyse the relation between ALMP and health status should have more frequent follow-ups due to the fact that the time in ALMP is limited. Finally, due to small sample size the lack of associations between ALMP and psychological symptoms may depend on Type 2 error. Therefore, our results need to be interpreted with caution.

**On the results**

Our findings indicate that there is a lack of associations between ALMP and psychological symptoms. However, due to the methodological shortages the results needs to be interpreted with caution. The methodological problems in our study may explain that our results are in contrast to earlier research within the field. A longitudinal panel study from Britain shows positive effects of government training on mental health measured with the General Health questionnaire [35]. The effect remains after the end of the programmes but decreases over time. A one-year follow-up study in Finland showed that labour market interventions had a significant effect on psychological distress, but the effects seemed to be restricted to the actual time in the interventions [36]. A Swedish longitudinal panel study analysed three different types of ALMP and showed that only those involving work place participation (in contrast to those involving
activation and vocational training) had a positive effect on mental health [11]. A possible explanation of these findings is that work place participation involves participation on the regular labour market, which according to Jahoda [10] may fulfil the psychological need for employment much better than the other two types of ALMP. The results from another Swedish study (with cross-sectional design) of an unemployment training programme showed that the women judged that their psychological health had been affected positively to a greater extent than the men did [37]. The different findings in this study compared to earlier research could depend on analyses of different types of ALMP – as our study could not separate between the different types. We agree with Hald Andersen [35] who argues for the need of more empirical research about which theory that can best explain why government training has a positive effect on mental health.

Aggregate level research show that every increase by 10 USD per person in the investment in ALMP reduced the effect of unemployment on suicide by 0.038% [12]. When investment was more than 190 USD per person and year, unemployment had no adverse effects on suicide rate. Thus, it seems as if social expenditures in ALMP could mitigate some of the adverse effects of the recession.

CONCLUSION
Due to methodological shortages our results that participation in ALMP was not related to psychological symptoms has to be interpreted with caution. There is a need for more well-designed studies, using a theoretical framework, within the field.

ACKNOWLEDGEMENTS
This study was financed by the Swedish Council for Working Life and Social Research. We are grateful to Hans Stenlund and David Granlund for their assistance with statistical analyses.
REFERENCES


APPENDIX. A complete list of all tested background selection variables at age 16.

Pupil’s questionnaire
1. Psychological symptoms (under the 75th percentile for having psychological symptoms=0, above the 75th percentile for having psychological symptoms=1)\(^1,2\)
2. Parent’s social class (white collar=0, one parent blue collar =1, both parents blue collar=2)\(^1,2\)
3. Unemployed in the family during the last year (yes=1, no=0)\(^1\)
4. Able to make own decisions at home (5 categories: very often, often, neither often nor seldom, seldom, very seldom)\(^1\)
5. Able to make own decisions at school (5 categories: very often, often, neither often nor seldom, seldom, very seldom)\(^2\)
6. Persons caring about pupil (7 categories: parents, siblings, one friend, many friends, teachers, other, nobody)\(^2\)
7. Do your parents help you with homework when you need? (5 categories: always, often, sometimes, seldom, never)\(^1\)
8. Own perception of poor use of interests and abilities at school (5 categories: as good as possible/very good, good, neither good nor bad, bad, very bad)\(^1\)
9. Do you want to do what you have planned to do in the fall term? (yes=0, no=1)\(^1\)
10. Do you think you can get the job you want? (yes=0, no=1)\(^1\)
11. Irregular physical activity (yes=1, no=0)\(^1\)
12. One or several peers abusing narcotic substances (yes=1, no=0)\(^1\)
13. Amount of alcohol consumed during a year (continuous)\(^1\)
14. Overweight (yes=1, no=0)\(^1\)
15. Daily smoking (yes=1, no=0)\(^1\)
16. Snuff-using (yes=1, no=0)\(^1\)
17. Are you satisfied with your outer appearance or not? (6 categories and 3 combinations: satisfied, too tall, too short, too fat, too slim)\(^1\)
18. Divorced parents (yes=1, no=0)\(^1\)
19. Contact with a father (5 categories: very good, good, neither good nor bad, bad, very bad/no contact)\(^2\)
20. Contact with a mother (5 categories: very good, good, neither good nor bad, bad, very bad/no contact)\(^2\)
21. Concerns about bad school results (yes=1, no=0)\(^2\)
22. Concerns about love problems (yes=1, no=0)\(^2\)
23. Concerns about problems with a friend (yes=1, no=0)\(^2\)
24. Concerns about troubles with the family (yes=1, no=0)\(^2\)
25. Have been reported to police (yes=1, no=0)\(^2\)
26. How much pocket money you receive/earn a month? (continuous)\(^2\)
27. Has own bedroom (yes=0, no=1)\(^2\)

Teacher’s questionnaire:
28. Pupil’s performing ability and talent (5 categories: very good, good, neither good nor poor, poor, very poor)\(^1\)
29. Pupil’s use of talent (5 categories: optimal, good, neither good nor poor, poor, very poor)\(^1\)
30. Problems in the family (no, I don’t think there are=0, yes, I know/yes, I think there are=1)\(^1\)
31. Teachers future prognosis for pupil in the labour market (5 categories: very good, good, neither good nor poor, poor, very poor)\(^1\)
32. Parents’ engagement in child’s studies5 categories:
Assessment of a pupil on a scale from 1 (high) to 6 (low) on the following items:
33. Tiredness\(^1\)
34. Anguish, dejection\(^1\)
35. Passivity\(^1\)
36. Close-mouthed\(^1\)
37. Dependent, supine\(^1\)
38. Aggressiveness\textsuperscript{2} \\
39. Fear, insecurity \\
40. Tendency of isolation \\
41. Negligence \\
42. Worried, restless \\
43. Unpopularity among peers \\
44. Unpopularity among teachers

\textsuperscript{1} significant variables that remained in the final step of the stepwise logistic regression for age 21 and were included in the model \\
\textsuperscript{2} significant variables that remained in the final step of the stepwise logistic regression for age 30 and were included in the model
Unemployment and ill health - a gender analysis.

Results from a 14-year follow-up of the Northern Swedish Cohort.

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Mehmed Novo, Medical Rehabilitation, Department of Community Medicine and Rehabilitation, Umeå University, SE-901 85 Umeå, Sweden

Anne Hammarström, Family Medicine, Department of Public Health and Clinical Medicine, Umeå University, SE-901 85 Umeå, Sweden
Abstract

Background

There is evidence that the relationship between unemployment and ill health differs between men and women, but the explanations for the gendered relationship between unemployment and ill health are seldom discussed. The aim of the present study was to analyse the associations between unemployment and ill health among men and women as well as to use the relational theory of gender to interpret the results.

Method

A cohort, consisting of all school-leavers in 1981 (1083 pupils) was followed for 14 years up to the age 30. Complete data were collected for 1044 individuals, i.e. 96.4% of the original sample. A sample for this study consisted of 386 women and 478 men who were either employed or unemployed at age 30. Health outcomes were suboptimal self-rated health and high alcohol consumption at age 30. The relational theory of gender was used to discuss the findings.

Results

A strong relation between unemployment and suboptimal self-rated health among women and high alcohol consumption among men was found, even after controlling for health-related selection, potential mediators and moderators. All factors in the model, i.e. financial difficulties, low perceived control, poor social network, unemployed friends, feeling looked down upon and future pessimism were attributable to suboptimal self-rated health among unemployed women. Financial difficulties and future pessimism were also substantially related to high alcohol consumption among unemployed men.

Conclusions

Associations were found between unemployment and suboptimal self-rated health among women and high alcohol consumption among men, even after controlling for health-related selection, potential mediators and moderators.

Keywords: unemployment, gender, self-rated health, alcohol
Background

A growing body of research has demonstrated that unemployment is related to ill health (Cohen, Kemeny, Zegans, Johnson, Kearney, & Stites, 2007; Janlert, 1997; McKee-Ryan, Song, Wanberg, & Kinicki, 2005) and although much of the research is still conducted without separate analyses for men and women, some of the research within the field indicates that the relationship between unemployment and ill health differs between men and women. However, the results are partly divergent. While some studies show that unemployment is more strongly related to poor mental health among men (Artazcoz, Benach, Borell, & Cortés, 2004; Thomas, Benzeval, & Stansfeld, 2007), other studies show that mental health is equally affected by unemployment among young men and women (Bjarnason & Sigurdadottir, 2003; Hammarström & Janlert, 1997). One study showed a relationship between unemployment and the onset of limiting illness, mostly due to musculoskeletal pain and cardiovascular diseases, which was slightly higher among men compared to women (Bartley, Sacker, & Clarke, 2004). Other studies about the relationship between unemployment and self-rated health showed that both unemployed men and women report lower self-assessed health than those employed (Kaleta, Makowiec-Dabrowska, & Jegier, 2008), but there are indications that unemployed women may run the highest risk of having poor self-rated health (Giatti, Barreto, & Cesar, 2008). The findings are also complex in relation to gender, unemployment and health behaviour. American studies that investigated the association between unemployment and alcohol consumption showed an increase of alcohol consumption only in unemployed men (Bolton & Rodriguez, 2009), but also that heavy drinking was related to unemployment independent of gender and age (Mossakowski, 2008). A study of young men and women in the Northern Swedish cohort showed a relationship between unemployment and increased alcohol consumption (Janlert & Hammarström, 1992). However, after controlling for having children, the relationship turned negative among women. Thus, having children was protective for alcohol consumption among young women, but not among young men. While some studies found associations between unemployment and smoking among men only (De Vogli & Santinello, 2005), other studies found these associations only among young women (Hammarström & Janlert, 2003).

However, the explanations for the gendered relationship between unemployment and ill health are seldom discussed. A gender theoretical approach could be used to understand the differences. But since 1990s, when a gender-theoretical review on health consequences of youth unemployment was published (Hammarström, 1994), there has generally been little effort in incorporating gender theories in unemployment research.

Overall, unemployment and health research continues to use theories that were inspired by the concept of the male as a breadwinner without sufficient reflection about the importance of changing contexts (Waters & Moore, 2002). Though unemployment research has shifted from studies on exclusively white middle-aged men (Feather, 1990), most of the current
studies either control for sex (Cohen, Kemeny, Zegans, Johnson, Kearney, & Stites, 2007; Mossakowski, 2008; Åhs & Westerling, 2005), or are done separately for sexes (Bacikova-Sleskova, van Dijk, Madarasova Geckova, Nagyova, Salonna, Reijneveld et al., 2007), thus missing the opportunity to compare health experiences and determinants of health for men and women (Annandale & Hunt, 2000). If gender is included, it is often treated as a property of an individual rather than a relational, dynamic construct (Kavanagh & Bentley, 2008).

Gender is an analytic category, and structural analyses of gender relations are central in medical gender research (Hammarström, 2007). The relational theory of gender is based on an understanding of gender as a structure of social relations between men and women (Connell, 2006). The multidimensional model of gender relations forms the organisational gender regime which is present in all sectors of society. The four distinct dimensions of gender relations - the power, production, emotional, and symbolic relations - will be used in the analysis of the present paper. Furthermore, the ideal versions of masculinity and femininity, such as Connell’s hegemonic masculinity and emphasized femininity, will be presented below (Connell, 2001) in order to analyse the association between unemployment and ill health from a gender perspective.

Different theoretical models have been used to explain the associations between unemployment and ill health (Janlert & Hammarström, 2009). The theory of economic stress is recognisably well documented showing that financial difficulties are related to decreased well-being among unemployed men and women (Stronks, van de Mheen, van den Bos, & Mackenbach, 1997; Thomas, Benzeval, & Stansfeld, 2007). Unemployed men might suffer from more financial stress because creation of dominant masculinity requires access and control over financial resources (Connell, 2005). On the other hand, the gendered division of labour may reduce women’s possibilities to receive sufficient unemployment benefits and therefore women may be more affected by financial stress caused by unemployment (Connell, 2005).

According to the demand-control model (Karasek & Theorell, 1990), subordinate status and lack of power among unemployed may reduce the ability to control the working situation and was found to be associated with health problems among women (Reine, Novo, & Hammarström, 2004). Lack of control, however, may have a negative impact on the construction of hegemonic masculinity among unemployed men (Connell & Messerschmidt, 2005).

Empirical evidence exists that social network and social support are associated with unemployment, but patterns of engagement into these relationships among men and women differ (Russell, 1999). Swedish research among young women has shown that feminities among unemployed women are constructed around relation orientations
(Hammarström, 2002), and insufficient social ties have been found to affect psychological and physical health among women in socioeconomically vulnerable positions (Kawachi & Berkman, 2001; Russell, 1999). Having unemployed friends may lead to alienation from mainstream values and changes in behaviour among those who are unemployed (Russell, 1999).

Health behaviour is not simply affected by unemployment, rather it is the result of the gender norms of masculinities and femininities and power relations that give privileges to men (Connell, 2006), but which adversely affect the health of both women and men (Sen, Östlin, & George, 2008). Unemployment is a stressful life event (Kagan & Levi, 1975), and maladaptive ways of coping through unfavourable health behaviour, in particular alcohol use, are more common among men than women (Courtenay, 2000; San Hosé, van de Mheen, van Oers, Makenbach, & Garretsen, 2000). Subordinate and marginalised men may construct their masculinity through engaging in dangerous and unhealthy behaviours that are symbolically associated with the dominant masculinity (Courtenay, 2000).

Employment gives a person identity thus fulfilling certain psychological needs (Jahoda, 1981). For example, work people do form part of their identity or sense of status in the society; but unemployment may impair self-image and make them feel disrespected for being unemployed (Kulik, 2000). In societies with low percentage of women in the labour force, men may experience more psychological stress than women because they are expected to enter the labour market which is an important component in the construction of dominant masculinity (Connell, 2001). Also, pessimism about the future could mediate the association between unemployment and ill health (Novo, Hammarström, & Janlert, 2001) and may be more common among women who have less power and resources to improve prospects in the future than men who are implicitly the power holders (Connell & Messerschmidt, 2005).

In unemployment research, it is important to acknowledge that the relationship between unemployment and ill health can go in two different directions. Besides the causal relationship between unemployment and ill health there may also be a reverse relationship. Health related selection, i.e. poor health at the baseline has been found to be a significant precursor of unemployment in both genders (Hammarström & Janlert, 2005; Jusot, Khlat, Rochereau, & Sermet, 2009; Kokko, Pulkkinen, & Puustinen, 2000) and needs to be taken into account. Also, earlier research shows that unemployment at a young age, low social class and having children are related to impaired health among unemployed men and women (Hammarström & Janlert, 2002; Laaksonen, Rahkonen, Martikainen, & Lahelma, 2005; Reine, Novo, & Hammarström, 2004). Furthermore, the effects of socio-demographic characteristics, unemployment history and
living conditions are found to be specific to gender and such labour market outcomes as unemployment (Bjarnason & Sigurdadottir, 2003).

The present paper has focused on two health measures. The first, self-rated health is a multidimensional concept which incorporates a variety of physical, psychological, emotional and behavioural components and is a global summary measure of health status indicating a person’s health-related well-being (Manderbacka, 1998). Self-rated health is also useful as a measure of general well-being and predictor for disease development (Emmelin, Weinehall, Stegmayr, Dahlgren, Stenlund, & Wall, 2003). The second measure, alcohol consumption, is a health behaviour related to unemployment (Dooley, Catalano, & Hough, 1992) and is a recognised risk factor for ill health in many countries (Baum, 2008).

The aim of the present study was to analyse the associations between unemployment and ill health among men and women as well as to use the relational theory of gender to interpret the results.

**Methods**

This longitudinal study was carried out in a medium-sized industrial town in the north of Sweden.

**Population**

The National Swedish Cohort, consisting of all 1083 pupils (506 girls and 577 boys) aged 16 who attended or should have attended the last year of compulsory school in 1981 was followed up at the ages of 16, 18, 21 and 30. Extensive work was carried out to reach every participant, including those who had moved, in order to minimize the non-response rate (Hammarström & Janlert, 2002). Complete data for the whole 14-year follow-up period were collected for 1044 individuals (497 women and 547 men), i.e. 96.4% of the original sample. A sample for this study was made of participants who were either employed or unemployed at age 30 (386 women, 478 men). Students, participants of labour market activities, those on, for example parental or sick-leave at age 30 were excluded from the analyses (111 women, 69 men).

**Procedure**

The questionnaires included items on psychological and physical symptoms, health behaviour, experiences of work and unemployment, as well as socio-economic data.

**Dependent variables**

*Self-rated health* was estimated through the single question at age 30 “How would you rate your overall health?” Possible answers were “good”
Alcohol consumption was measured with a battery of questions about frequency and amount of alcohol consumption. The volume of different alcoholic beverages was converted into decilitres of pure alcohol. Beer was considered to contain 4.5% alcohol, wine 10% and spirits 40% alcohol. The estimate average alcohol volume for each alcohol type was calculated by multiplying the occasions per year on which alcohol was drunk by the volume of alcohol at each occasion. The resulting product was the approximate per annum alcohol consumption in decilitres of pure alcohol. High alcohol consumption at age 30 was dichotomized at the 75th percentile (33.28 dl pure alcohol/year among men, 12.24 dl/year among women, respectively).

### Independent variables at age 30

The study population was dichotomised into two groups: employed (reference) - those having full or part time work at the time of investigation at age 30 (318 women, 418 men),

and unemployed (=1) – those being unemployed at least six months in the time between ages 21 and 30 and at the time of investigation (combined measure of long-term unemployment and the present exposure) at age 30 (68 women, 60 men).

### Potential moderators at ages 21 and 30

Moderators are variables associated with both the dependent and the independent variables. The variables below were defined as moderators in the present study. If a person was without a job for at least 6 months between ages 16 and 21, the variable was defined as early unemployment (=1). To have children was measured with one question and defined as those having at least one child at age 30 (=1). Socio-economic position was measured with one question about the participant’s own occupation at age 30 and defined according to the Swedish socio-economic (SEI) classification of occupational categories (1982); blue-collar occupation (or manual worker) was coded as 1 and white-collar occupation (or non-manual worker) was coded as 0.

### Health-related selection at age 16

A question on self-rated health was for the first time included in the questionnaire at age 30. In previous surveys we used well-known and validated questionnaires for somatic and psychological symptoms from the Swedish Survey of living conditions (Thorslund & Wänderyd, 1985). These questionnaires included ten questions on indices of somatic and psychological symptoms during the last year. The range of the index was from 0 to 6 for psychological symptoms, and from 0 to 12 for somatic
somatic and psychological symptoms. We carried out a correlation analysis between self-related health at age 30 and those indices. The correlations were quite strong (p<0.05) – 0.415 for somatic and 0.354 for psychological symptom index. Thus, we assumed that we could use indices on somatic and psychological symptoms at age 16 as indicators health-related selection.

Alcohol consumption at age 16 was measured and dichotomised in the same way as at age 30 and was also used as an indicator of health-behaviour-related selection.

Potential mediators at age 30

Mediators are variables that interplay between the dependent and the independent variables.

Financial difficulties (cash margin) was measured with one question about the possibility of obtaining a certain amount of money (corresponding to 1300 euros), with alternative responses yes (=0) or no (=1).

A negative answer to the question “Do you do what you want to do?” regarding occupation (work, studies, unemployment, etc.) was considered to reflect low perceived control (=1) (Hammarström, 1990).

Validated questions on social network and social support indices were used in our study (Henderson, Duncan-Jones, Byrne, & Scott, 1980). Social network was measured with four questions (each with six answer alternatives) about quantitative social network (range 4 to 24). Social support (material and emotional) was measured with six questions (with four answer alternatives) about qualitative aspects of social support (range 6 to 24). The proportion above the cut-off point at the 75th percentile was defined as those with poor social support (=1) and poor social network (=1), correspondingly. The statement “People look down on me” was measured on a 7-grade scale from “disagree” to “completely agree”. The proportion above the cut-off point at the 75th percentile was defined as those feeling looked down upon (=1). Having unemployed friends (=1) were contrasted to no unemployed friends (=0). Future pessimism was coded as 1 if a person felt discouraged when thinking about the future rather or very often in contrast to seldom and almost never (=0).

Statistics

Windows version 15.0 of SPSS was used for data analysis. All analyses were performed separately for men and women. Chi-square test was used for categorical and t-test for continuous variables.

Sensitivity analyses were performed for both the dependent and the independent variables with ordinal scales in order to define how to dichotomise variables (Reine, Novo, & Hammarström, 2008). The results
were the same in the sensitivity analyses, therefore the guiding principle was to dichotomise at the 75th percentile in order to define a group with a substantial size.

A series of logistic regression analyses, expressed in odds ratios (OR) with 95% confidence intervals (CI), were performed. Bivariate regression model tested the association between suboptimal self-rated health as well as high alcohol consumption and unemployment (Table 2). Separate multivariate regression models were fitted to determine the association between health indicators, unemployment and each of the potential mediating factors (Tables 3 and 4), and were then adjusted for potential moderating factors. A reduction in OR in per cent was calculated for the model after adjustment for moderating factors. A reduction of 10% was considered as a substantial influence on the health outcome (van de Mheen, Stronks, & Makenbach, 1998).

The Ethics Committees of Umeå and Uppsala Universities approved the study.

**Results**

Table 1 contains descriptive data on the distribution of the health indicators and the independent variables among employed and unemployed men and women. The results showed significantly higher proportion of suboptimal self-rated health among unemployed women compared to employed women and unemployed men. Among unemployed men there was almost twice as high proportion of high alcohol consumers than among those employed.
According to Table 1, there were more differences between employed and unemployed men than for employed versus unemployed women. Unemployed of both genders at age 30 were consuming more alcohol at age 16, had more experience of early unemployment, had more financial difficulties, felt being looked down upon and were more pessimistic about the future that those unemployed, but having poor social network was more common among those employed. More unemployed women had children compared to employed women. Among men, those who were unemployed experienced lower control and more had unemployed friends at age 30, and reported more psychological symptoms at age 16 compared to employed. Among employed, all significant differences were in favor to men, i.e. more women experienced financial difficulties, felt being looked down upon and were pessimistic about the future at age 30. Both employed and unemployed women had more children compared to men. Among unemployed, more men had somatic and psychological symptoms at age 16, were blue-collar workers and had more unemployed friends at age 30 compared to women.
Table 2. Bivariate logistic regression analyses for suboptimal self-rated health and high alcohol consumption in relation to unemployment among women and men at age 30, (OR, odds ratio, CI, confidence interval).

<table>
<thead>
<tr>
<th></th>
<th>Suboptimal self-rated health</th>
<th>High alcohol consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>OR (95% CI)</td>
</tr>
<tr>
<td>WOMEN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Unemployed</td>
<td>3.31 (1.85-5.92)</td>
<td>1.47 (0.81-2.68)</td>
</tr>
<tr>
<td>MEN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Unemployed</td>
<td>1.57 (0.83-2.99)</td>
<td>2.14 (1.18-3.89)</td>
</tr>
</tbody>
</table>

Table 3. Odds ratio (and 95% CI) in logistic regression analyses for suboptimal self-rated health in relation to unemployment, when adjusted for potential confounders. Model 1: bivariate analyses. Model 2: multivariate analyses for the association between unemployment and suboptimal self-rated health, adjusted for each of the potential mediators and all moderators.

<table>
<thead>
<tr>
<th>Variables (age 30)</th>
<th>Model 1 (bivariate)</th>
<th>Model 2 (multivariate) adjusted for each potential mediator separately and all moderators a</th>
<th>Proportions (% of change) of odds for having suboptimal self-rated health related to unemployment that is explained by each potential mediator b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>3.31 (1.85-5.92)</td>
<td>2.72 (1.45-5.10)</td>
<td>-</td>
</tr>
<tr>
<td>adjusted for potential mediators</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for financial difficulties</td>
<td>2.45 (1.30-4.62)</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for low perceived control</td>
<td>2.76 (1.48-5.12)</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for poor social network</td>
<td>2.70 (1.45-5.04)</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for poor social support</td>
<td>2.84 (1.53-5.27)</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for unemployed friends</td>
<td>2.73 (1.46-5.10)</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for feeling looked down upon</td>
<td>2.65 (1.42-4.97)</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for future pessimism</td>
<td>2.32 (1.21-4.46)</td>
<td>43</td>
<td></td>
</tr>
</tbody>
</table>

a Multivariate analyses: unemployment adjusted for each of the potential mediators separately, health-related selection at age 16 as well as for all moderators (early unemployment between ages 16-21, blue-collar occupation at age 30, and having children at age 30).

b Reduction of the odds for suboptimal self-rated health in relation to unemployment after full adjustment i.e. for each of the potential mediators and all moderators. Percentage of change: (unadjusted model-fully adjusted model)x100/(unadjusted model-1), e.g. 3.31-2.45x100/(3.31-1) for suboptimal self-rated health in relation unemployment when adjusted for financial difficulties and all moderators.
Table 4. Odds ratio (and 95% CI) in logistic regression analyses for high alcohol consumption in relation to unemployment, when adjusted for potential confounders. Model 1: bivariate analyses. Model 2: multivariate analyses for the association between unemployment and high alcohol consumption, adjusted for each of the potential mediators and all moderators. Men

<table>
<thead>
<tr>
<th>Variables (age 30)</th>
<th>Model 1 (bivariate)</th>
<th>Model 2 (multivariate) adjusted for each potential mediator separately and all moderators</th>
<th>Proportions (%) of change of odds for having suboptimal self-rated health related to unemployment that is explained by each potential mediator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR, 95% CI</td>
<td>OR, 95% CI</td>
<td></td>
</tr>
<tr>
<td>Unemployment</td>
<td>2.14 (1.18-3.89)</td>
<td>2.07 (1.09-3.96)</td>
<td>-</td>
</tr>
<tr>
<td>Unemployment when adjusted for financial difficulties</td>
<td>2.03 (1.05-3.92)</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for low perceived control</td>
<td>2.15 (1.12-4.11)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for poor social network</td>
<td>2.14 (1.11-4.11)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for poor social support</td>
<td>2.08 (1.09-3.98)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for unemployed friends</td>
<td>2.12 (1.10-4.10)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for feeling looked down upon</td>
<td>2.34 (1.16-4.31)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Unemployment when adjusted for future pessimism</td>
<td>1.95 (1.02-3.74)</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

a Multivariate analyses: unemployment adjusted for each of the potential mediators separately, health-related selection at age 16 as well as for all moderators (early unemployment between ages 16-21, blue-collar occupation at age 30, and having children at age 30).

b Reduction of the odds for high alcohol consumption in relation to unemployment after full adjustment i.e. for each of the potential mediators and all moderators. Percentage of change: (unadjusted model-fully adjusted model)x100/(unadjusted model-1), e.g. 2.14-2.03x100/(2.14-1) for high alcohol consumption in relation unemployment when adjusted for financial difficulties and all moderators.
Bivariate logistic regression was performed in order to assess the association between the health outcomes and unemployment. Significant associations were found between unemployment and suboptimal self-rated health only among women and high alcohol consumption only among men. Thus, further analyses were only conducted on these items.

Tables 3 and 4 show the contribution of each potential mediating factor to the association between unemployment and suboptimal self-rated health and high alcohol consumption, adjusted for potential moderators among women and men, respectively. For women (Table 3, Model 2), it seemed that all potential mediators substantially reduced the OR for suboptimal self-rated health in relation to unemployment, i.e. between 20 to 43%. The strongest explanatory factors were future pessimism (43%) and financial difficulties (37%). For men (Table 4, Model 2), only two variables – financial difficulties and future pessimism - had an explanatory value of 10%.

**Discussion**

In the present study we found associations between unemployment and suboptimal self-rated health among women, and unemployment and high alcohol consumption among men, even after controlling for health-related selection, potential mediating and moderating factors. All factors included in the model (Table 3) were attributable to suboptimal self-rated health among unemployed women. Financial difficulties and future pessimism were also substantially related to high alcohol consumption among unemployed men (Table 4).

**On the method**

Data on health outcomes and possible explanatory factors were obtained at the same time point (age 30) and thus could not give knowledge about the sequence of events. We used this analysis to get indications about potential mediators/moderators.

Another possible limitation of this study was unavailability of a question on general self-rated health before the age of 30. The correlations between
self-rated health and psychological and somatic health at age 30 were strong, therefore we decided that using psychological and somatic health at age 16 as indicators of health-related selection for self-rated health at age 30 would be appropriate.

The strength of this study is its longitudinal design that enabled the control for the health situation at the beginning of the follow-up and early unemployment which are known to be associated with poor self-rated health and poor health habits in adulthood in both men and women (Hammarström & Janlert, 2002; Laaksonen, Rahkonen, Martikainen et al., 2005).

**On the Results**

The results of this study indicated that there was a significant association between unemployment and suboptimal self-rated health among women, and unemployment and high alcohol consumption among men, even after controlling for health-related selection, as well as for potential mediating and moderating factors.

Financial difficulties was one of the two factors explaining the relationship between unemployment and ill health both among men and women, which is supported by a number of other studies (Stronks, van de Mheen, van den Bos et al., 1997; Thomas, Benzeval, & Stansfeld, 2007). Although it is not possible to make exact comparisons between suboptimal self-rated health and excess alcohol consumption, the explanatory value of financial difficulties seemed to be stronger among women. Generally, people with financial problems experience financial stress as negatively affecting their health (Creed & Macintyre, 2001; Rantakeisu, Starrin, & Hagquist, 1999; Thomas, Benzeval, & Stansfeld, 2007). In our study we found that financial difficulties related to unemployment were strongly associated with ill health among both genders. The concept of the welfare state in Sweden is based on active participation in the labour market to the same extent for men and women (Gonäš, 1994). Employment is supposed to benefit both men and women by contributing to status and power as well as economic independence, social support, and self-esteem, compared to those unemployed (Ross & Mirowsky, 1995). However, the gendered division of labour can result in better financial position among men (Connell, 2005), which we also found in this study (Table 1).

Future pessimism seemed to have the highest explanatory value for ill health in relation to unemployment among women and men. Our findings are thus consistent with earlier results from a study on the same cohort at a younger age (Novo, Hammarström, & Janlert, 2001). Another possible reason why future pessimism had a high substantial explanatory value among both genders could be attributed to the period of recession in the Swedish labour market in the mid 1990s when health inequalities caused by
unemployment were increasing, and people generally had poorer prospects in the labour market (Novo, 2000), by having limited power and little ability to make their own choices.

Unemployed, marginalised women are more often found in subordinate positions in the society, which may make them feel powerless (Connell, 2006). This might explain our findings why low perceived control had a high explanatory value for suboptimal self-rated health among women only. In patriarchal societies where men are implicitly present as the power holders, women are commonly excluded from power and decision making (Connell, 1996). An unemployment situation may also mean that unemployed women have limited power to control their lives which may lead to ill health (Walters & Charles, 1997).

As an emotional dimension of gender relations (Connell, 2006), social support is assumed to be related to traditional femininity and may be valued more for women than for men (Waters & Moore, 2002). Indeed, we found that poor social support and poor social network substantially explained the relationship between unemployment and suboptimal self-rated health among women. In contrast to British findings (Russell, 1999), the present study showed that employed women had poorer social networks than those unemployed. Unemployed people had slightly more unemployed friends compared to those employed, which was also found in the British study (Russell, 1999). An American review on social ties suggests that women’s networks are generally more supportive than men’s (Kawachi & Berkman, 2001), and therefore might provide more help during unemployment. However, if the majority of the individual’s network is unemployed, they may be unable to provide social, financial and emotional support because of their own problems (Russell, 1999).

It has been argued that women’s identities in western societies are broad enough to include employment alongside childcare and household responsibilities, and therefore their self-esteem when becoming unemployed becomes less impaired than men’s who have their identities strongly rooted in the employee or breadwinner role (Waters & Moore, 2002). However, our results from a Swedish context indicated the opposite in showing that feeling looked down upon explained as much as 29% of the association between unemployment and suboptimal self-rated health among women. Results from an Israeli study indicated that unemployment was related to impaired self-image among young adults of both genders, and made them feel disrespected for being unemployed (Kulik, 2000). Low self-esteem, however, can give rise to ill health (Walters & Charles, 1997). Thus, it seemed that the symbolic dimension of gender relations (Connell, 2006) involves employment as an increasingly important part of gender identity creation among women, and therefore explains the association between unemployment and ill health.
Finally, one should not rule out the possibility that different social groups have different thresholds for reporting ill health (Fritzell, Nermo, & Lundberg, 2004) which could explain why association between unemployment and suboptimal self-rated health was found among women but not men. Generally, women tend to report more ill-health than men do (Baum, 2008), and the differences in reporting are determined by the gendered patterns and attitudes to illness. The constructions of masculinity may influence the way in which men report on their health problems and are based in social constructions in masculinity (Connell, 2006). The explanation why we found the association between unemployment and high alcohol consumption among men but not women could be that men are more open to report on their alcohol patterns, because drinking is in particular symbolically associated with masculinity among subordinate and marginalised men (Courtenay, 2000).

**Conclusions**

Associations were found between unemployment and suboptimal self-rated health among women and high alcohol consumption among men, even after controlling for health-related selection, potential mediators and moderators.

**Acknowledgements**

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References


