Thesis for the degree of Doctor of Philosophy, Sundsvall 2012

Health and Social Determinants

Among Boys and Girls in Sweden:

Focusing on Parental Background

Heidi Carlerby

Supervisors:
Katja Gillander Gådin
Eija Viitasara
Anders Knutsson
Department of Health Sciences

Mid Sweden University, SE-851 70 Sundsvall, Sweden
ISSN 1652-893X,
Mid Sweden University Doctoral Thesis 135
ISBN 978-91-87103-39-1

Akademisk avhandling som med tillstånd av Mittuniversitetet i Sundsvall framläggs till offentlig granskning för avläggande av filosofie doktorsexamen 23 november, 2012, klockan 10.15 i sal M108, Mittuniversitet Sundsvall. Disputationen kommer att hållas på svenska.

Health and social determinants among boys and girls in Sweden:

focusing on parental background

Heidi Carlerby

Department of Health Sciences
Mid Sweden University, SE-851 70 Sundsvall
Sweden
Telephone: + 46 (0)771-975 000

Printed by Kopieringen Mid Sweden University, Sundsvall, Sweden, 2012

"… promote the integration and well-being of these children and … assure that they are in a position to effectively contribute to the society and broader economy of the countries where their parents have settled (Hernandez, Macartney and Blanchard, 2010, p. 431)"

To my beloved family: Erica, Jonas and Magnus

ABSTRACT

Heidi Carlerby (2012)
Health and social determinants among boys and girls in Sweden: focusing on parental background
Department of Health Sciences
Mid Sweden University, Sundsvall, Sweden
ISSN 1652-893X, Mid Sweden University Doctoral Thesis 135;
ISBN 978-91-87103-39-1

The majority of Swedish boys and girls have good psychosomatic health. Despite that the risk of mental health problems such as nervousness, feeling low and sleeping difficulties has increased steadily in recent decades. Moreover, previous surveys on health and well-being indicate that boys and girls of foreign extraction in Sweden are at increased risk of ill health compared to boys and girls of Swedish background.

The main aim of this thesis was to analyse health and social determinants among boys and girls of foreign extraction in Sweden. The factors explored in papers I–IV include parental background, family affluence and gender and their associations with subjective health complaints, psychosomatic problems or health risk behaviours. Other included risk factors for ill health were involvement in bullying, low participation and discrimination at school. This thesis takes an intersectional perspective, with ambitions to be able to emphasize the interplay between different power relations (i.e. gender, social class and parental background).

Two sets of cross-sectional data were used. Three papers were based on the Swedish part of the World Health Organization's Health Behaviour in School-Aged Children. The sample consisted of 11,972 children (boys n = 6054; girls n = 5918) in grades five, seven and nine from the measurement years 1997/98, 2001/02 and 2005/06. The response rate varied between 85 and 90%. About one fifth of the included children were of foreign extraction. For the fourth paper regional data from Northern Sweden were used. Boys (n = 729) and girls (n = 798) in grades six to nine answered a questionnaire in 2011 and the response rate was 80%. About 14% of the included children were of foreign extraction. Statistical methods used were chi-square test, correlation analyses, logistic regression analyses, cluster analyses and test of mediating factor.

The results showed that girls of foreign background were at increased risk of subjective health complaints (SHC) and boys of mixed background were at increased risk of psychosomatic problems (PSP). Increased risk of allocation to the

cluster profile of multiple risk behaviour was shown in boys and girls of mixed background, in girls of foreign background and in girls of low family affluence. Increased risk of allocation to the cluster profile of inadequate tooth brushing was shown in boys and girls of foreign background and in girls of low family affluence. General risk factors for increased risk of ill health for boys and girls in Sweden were: any form of bullying involvement, low family affluence, low participation and discrimination at school, of which the latter also was a mediating factor for ill health. Living with a single parent was a risk factor for ill health among girls.

The results can function as a basis for developing health promotion programmes at schools that focus on social consequences of foreign extraction, family affluence, participation as well as health risk behaviours and gender.

Keywords: bullying involvement, discrimination, foreign extraction, gender, WHO-HBSC, intersectional perspective, health risk behaviour, parental background, PSP, SHC, SCOS, socio-demography

SAMMANFATTNING

Svensk titel: Hälsa och sociala bestämningsfaktorer bland flickor och pojkar i Sverige: med fokus på föräldrahärkomst

Majoriteten av flickorna och pojkarna i Sverige har en god psykosomatisk hälsa. Trots det har risken för psykiska hälsosymptom såsom nervositet, att känna sig nere och sömnsvårigheter ökat successivt de senaste årtiondena. Dessutom indikerar tidigare forskning angående hälsa och välmående att flickor och pojkar med utländsk härkomst har ökad risk för ohälsa jämfört med flickor och pojkar med svensk härkomst.

Denna avhandlings huvudsyfte var att analysera hälsa och sociala bestämningsfaktorer bland flickor och pojkar i Sverige, med fokus på föräldrabakgrund. Artiklarnas (I–IV) syften inkluderar föräldrahärkomst, familjens materiella tillgångar och genus samt dess samband med subjektiva hälsobesvär, psykosomatiska problem eller hälsoriskbeteenden. Andra riskfaktorer för ohälsa som inkluderades var inblandning i mobbning, lågt deltagande och förekomst av diskriminering på skolan. Denna avhandling beaktar ett intersektionellt perspektiv med ambitionen att kunna tydliggöra samspelet mellan olika maktordningar (dvs. genus, social klass och föräldrabakgrund).

Två dataset från tvärsnittsstudier har använts. I de tre första artiklarna användes World Health Organization – Health Behaviour in School-Aged Children, som i Sverige heter Svenska skolbarns hälsovanor. Studiepopulationen bestod av 11 972 barn (flickor n = 5918; pojkar n = 6054) i årskurserna fem, sju och nio undersöknings år 1997/98, 2001/02 och 2005/06. Svarsfrekvensen var mellan 85 och 90 %. Ungefär en femtedel av barnen som deltog hade utländsk härkomst. I den fjärde artikeln användes regional data från norra Sverige. Flickor (n = 798) och pojkar (n = 729) i årskurserna sex till nio deltog i studien år 2011, svarsfrekvensen var 80 %. Omkring 14 % av barnen hade utländsk härkomst. De statistiska metoder som användes var sambandstest (chi-två), test av linjära samband så kallade korrelationsanalyser, logistisk regressionsanalys, klusteranalys och test av medierande faktor.

Resultaten visade att flickor med utländsk bakgrund hade ökad risk för subjektiva hälsobesvär (SHC) och pojkar av mixbakgrund hade ökad risk för psykosomatiska problem (PSP). Ökad risk för att hamna i klusterprofilen multipelt hälsoriskbeteende hade flickor och pojkar med mixbakgrund, flickor med utländsk bakgrund samt flickor i familjer med låg nivå av materiella tillgångar. Ökad risk för att hamna i klusterprofilen bristande tandborstning hade flickor och pojkar

med utländsk bakgrund och flickor i familjer med låg nivå av materiella tillgångar. Generella riskfaktorer för ohälsa bland flickor och pojkar i Sverige var: alla former av inblandning i mobbning, låg nivå av materiella tillgångar i familjen, lågt deltagande och förekomst av diskriminering på skolan, vilken den senare även var en medierande faktor för ohälsa. Att leva med en ensamstående förälder var en riskfaktor för ohälsa bland flickor.

Avhandlingens resultat kan ligga till grund för utformande av hälsofrämjande interventioner inom elevhälsan, till exempel interventioner som fokuserar på sociala konsekvenser av utländsk härkomst, familjens materiella tillgångar, deltagande och diskriminering samt hälsoriskbeteenden och genus.

Nyckelord: mobbning, diskrimination, utländsk härkomst, genus, WHO-HBSC, intersektionalitetsperspektiv, hälsoriskbeteende, föräldrabakgrund, PSP, SHC, SCOS, sociodemografi

TABLE OF CONTENTS

LIST OF PAPERS

This thesis is based on the following studies, which are referred to in the text by their Roman numerals:

Paper I — Carlerby H, Viitasara E, Knutsson A & Gillander Gådin K (2011). Subjective health complaints among boys and girls in the Swedish HBSC study: focussing on parental foreign background. *International Journal of Public Health* 56: 457−464

Paper II — Carlerby H, Viitasara E, Englund E, Knutsson A & Gillander Gådin K (2012). Risk behaviour, parental background and wealth – a cluster analysis among Swedish boys and girls in the HBSC study. *Scandinavian Journal of Public Health* 40: 368−376

Paper III — Carlerby H, Viitasara E, Knutsson A & Gillander Gådin K (2012). How bullying involvement is associated with the distribution of parental background and with subjective health complaints among Swedish boys and girls. *Social Indicator Research* DOI number: 10.1007/s11205-012-0033-9

Paper IV — Carlerby H, Viitasara E, Knutsson A & Gillander Gådin K. How discrimination and participation are associated with psychosomatic problems among boys and girls in northern Sweden. *Health* (Accepted for publication 24 August 2012)

LIST OF ABBREVIATIONS AND DEFINITIONS

CI	Confidence interval
CVD	Cardiovascular disease
Degrading treatment	Uncivil behaviour, such as bullying others
Determinants of Health	Structural and individual factors that influence health, such as neighbourhood, environment, family, education, income, food, lifestyle behaviours, spirituality and ethnicity
DIF	Differential item function
FAS	Family affluence scale
Foreign background	Children of two foreign-born parents
Foreign extraction	Children of two foreign-born parents or children of mixed background included in same subgroup
HR	Hazard ratio
HRB	Health risk behaviours
Intersectionality	Dynamic social processes between e.g. gender, social class, ethnicity, spirituality and sexual orientation
MIUN	Mid Sweden University
Mixed background	Children of one foreign- and one Swedish-born parent
OR	Odds ratio
PSP	Psychosomatic problems
SALAR	Swedish Associations of Local Authorities and Regions
SCB	Statistics Sweden
SCL	Symptom check list (the SHC instrument)
SCOS	Social and civic objective scale
SES	Socioeconomic status
SHC	Subjective health complaints
SNAE	Swedish National Agency for Education
SNIPH	Swedish National Institute of Public Health
Social constructions	Sets of dynamic developed practices, such as gender, ethnicity, culture and spirituality
Social gradient of health	Position in the social hierarchy that influence health, such as income, education and social network
SRH	Self-rated health
Swedish background	Children of two Swedish-born parents
Swedish children	In this thesis children who live and have their daily practice in Sweden
WHO-HBSC	World Health Organization – Health Behaviour in School-Aged Children

PREFACE

My theoretical foundation and experience as a public health nurse and as master of sciences in public health includes an active standpoint to include all citizens without any exceptions while focusing on health among children of foreign extraction. My intention with this thesis was to investigate from a public health perspective the health circumstances of families who had migrated, with the focus on boys and girls, by exploring relations associated with health from perspectives of gender, material welfare in the family and parental background. About ninety-five percent of all children who grow up in our society are Swedish-born. Approximately one fourth of all children in Sweden are of foreign extraction. As socio-demographics make sense from childhood onwards, inequalities in health due to differences in socio-demographics were prioritized. It is therefore necessary to categorize the children in subgroups according to their parental background and family affluence and do separate analyses for boys and girls.

BACKGROUND

Health among boys and girls in general in Sweden

The majority of Swedish adolescent boys and girls have good psychosomatic health (Hagquist 2008; SNIPH 2011). Although most children experience good health, however, time trend studies from 1985/86 to 2005/06 among Swedish boys and girls in grades five, seven and nine show that the risk of mental health problems such as nervousness, feeling low and sleeping difficulties has increased steadily. Since the initial data collection the risk of mental health problems has increased twofold for boys in grade nine. During same period the risk of mental health problems has increased four times for girls in grade seven and almost six times for girls in grade nine (Hagquist 2010). The experience of stress from school work increases with age and that feeling of stress is higher among 15-year-old girls than among boys (SNIPH 2011). Swedish boys and girls follow the same patterns, with increased risk of subjective health complaints such as headache, dizziness, irritability and sleeping difficulties by grade and gender, as with boys and girls in other European and North American countries (Currie et al. 2004; Currie et al. 2008a; Currie et al. 2012). Increased proportions of pupils who report multiple subjective health complaints once a week or more indicate a decrease in pupils' health (Karvonen et al. 2005), and this is a challenge for public health work (Srabstein and Piazza 2008). However, the mapping of reports and research regarding Nordic adolescents' mental health shows that the time trend of increased mental health might be broken (Augustsson and Hagquist 2011).

Health among boys and girls of foreign extraction

Previous surveys of health and well-being indicate that boys and girls of foreign extraction[1] in Sweden are at increased risk of ill health compared to boys and girls of Swedish background (Engström et al. 2004; Holmberg and Hellberg 2008; Ravens-Sieberer et al. 2008; Vinnerljung et al. 2007). A Swedish study among 13-year-old children shows an increased risk of dental caries among children of foreign extraction compared to children with a Swedish background (Julihn et al. 2010). A Swedish register study (based on occasions that required professional medical treatment) of boys and girls aged 10–18 years involved in inter-personal violence-related injuries and self-inflicted injuries, shows increased relative risk in boys and girls of two foreign-born parents (Engström et al. 2004). Comparisons of

[1] Persons/children of foreign background or of mixed background are included in the same subgroup.

subgroups of adolescents aged 13–18 shows that boys of Turkish, Middle Eastern and Finnish origin are at three times higher risk than boys of Swedish origin of reporting episodes of depression during the last week. Girls of Turkish or Middle Eastern origin have double the risk of reporting being on a diet compared to girls of Finnish or Swedish origin (Holmberg and Hellberg 2008). A Swedish register study with young adults shows increased hazards ratio (HR 1.6–2.3) for self-harm among young people of two foreign-born parents (except those of South European origin) as compared to those of Swedish origin. Particularly at risk of self-harm were women (HR 2.1–2.3), young people from Finland (HR 1.6–1.9), Western Europe (HR 1.2–1.7) and those of mixed background (HR 1.4–1.5) (Jablonska et al. 2009). The Nordic study with boys and girls aged 2 to 17 based on parental responses showed that boys and girls of foreign background reported significantly higher levels of subjective health complaints (SHC), such as headache, back pain, stomach pain, loss of appetite, dizziness, sleeping disorders, and a lower feeling of well-being compared to children in the majority population (Reinhardt and Madsen 2002). Research from the US (Weathers et al. 2008) and Italy (Vieno et al. 2009) also shows increased risk of ill health among boys and girls of migrant parents compared to boys and girls of the majority population. A Swiss literature review showed increased risk of obesity, dental caries, psychosocial ill health and infectious diseases in children of migrant background (Jaeger et al. 2012).

Theoretical point of departure

Health from a public health perspective

According to the original WHO definition from 1948, health is "*a state of mental, physical and social well-being and not merely the absence of disease or infirmity*" (WHO 2012). The word *health* comes from the Old English word *heal* which means *whole* and in the WHO definition of health this *whole* is the positive perspective of health and is named *well-being* (Naidoo and Willis 2009). The Western biomedical model of health is still most common in epidemiologic research, i.e. to measure health by indicators of ill health or absence of disease (Naidoo and Willis 2009). The holistic state of mental, physical and social well-being is described by Antonovsky (1987) as a dynamic life-long continuum between health and ill health where the individual strives to achieve health.

In this thesis the concept of health is approached with self-rated health (SRH) as measures of subjective health complaints (SHC) and psychosomatic problems (PSP). Self-rated health (SRH) is a measure of individuals' spontaneous assessment of their own health (Breidablik et al. 2008) by rating the occurrence of SHC and PSP, in contrast to diseases which are verified by medical diagnoses (Last 2007).

Subjective health complaints is an established instrument developed and used in the WHO-HBSC survey since its beginning in 1984 (Haugland et al. 2001). Another SRH instrument is PSP, which was developed under the influence of the SHC (Hagquist 2008). The researchers of a Norwegian study (Breidablik et al. 2008) claim that SHR is an important, stable and broad construct related to the self-concept of health, which can predict disability, morbidity and mortality. SHR does not reflect the actual medical health status among the adolescents (Breidablik et al. 2008).

The conditions for succeeding in breaking a negative spiral (such as smoking or inappropriate tooth brushing behaviour) into a positive behaviour depend on the individual starting point in the hierarchical structure (Marmot 2006). Examples of components that determine the socioeconomic position in the hierarchical structure are length of education, income and occupation (Lynch and Kaplan 2000). Marmot (2006) describes the individual's starting point in the hierarchical structure as the social gradient. Further, Marmot describes how an individual's health and resistance against ill health are strongly associated with the social gradient. The higher the social gradient (or position) in the society, the more protecting factors a person has access to, leads to better health and longer life (Marmot 2006). The socioeconomic position is also related to power relations such as alienation, exclusion and subordination to others (Lynch and Kaplan 2000). At a societal level the creation of supportive environments for health has its foundation in the work against inequalities and emphasizes the contrasts between poor and rich countries or regions. Determinants of health at a structural level are peace, education, food, income, a stable ecosystem, social justice and equity among the inhabitants in the society (Dahlgren and Whitehead 2007) (Figure 1).

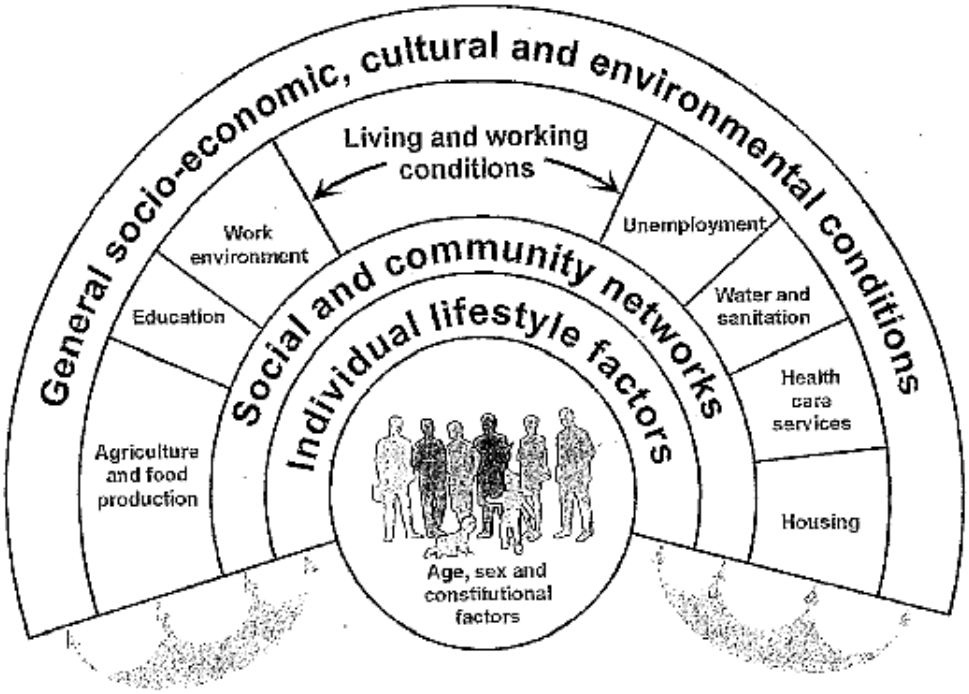


Figure 1. The Main Determinants of Health (Dahlgren and Whitehead 2007)

Gender and intersectionality

Gender is conceptualized as the social dimensions of the biological sex: that is social practices of being a man or a woman, known as "doing gender" – a dynamic condition continuously under construction. In a western contemporary context women, for example, are expected to inherit traits such as self-sacrificing, caring, being gentle and taking care of the household, whereas men are expected to inherit traits such as decision-makers, breadwinners and being good at sports (Connell 2009). Gender thus concerns social constructions but also power relations. With the purpose of gaining a wider understanding of the social aspects of gender, more recent gender research has to a greater extent started to take into account the ways in which gender interacts with other social structures such as ethnicity and social background (Connell 2009). This theoretical development of intersectionality focuses on the importance of asymmetric power relations (Sen & Östlin 2010). The intersectional model in this thesis is influenced by a categorical approach suggested by McCall (2005). The feminist researcher Yuval-Davis (1997) stresses the necessity of defending the heterogeneity of people's social nature and in dialogue paying attention to the individuals' identities and avoiding unwanted

homogenization. However, studies of social circumstances for health require the categorization of individuals into subgroups according to gender, social class, ethnicity and so on (Parker and Roberts 2005).

Causes behind increased risk of ill health among people who have migrated

The socioeconomics and health of the parents influence the social context as well as health and well-being of their children. Swedish research on people who have migrated shows associations between SES and health (Bask 2005; Bäckman and Franzén 2007; Stenbeck and Hjern 2007). Reasons behind increased risk of ill health, such as myocardial infarction, stroke, cancer and mental disorders, are socioeconomic vulnerability, for example dependency of social assistance (Stenbeck and Hjern 2007) and other forms of social exclusion (Bask 2005). Examples of social exclusion are economic problems, crowded housing, long-term unemployment, threats or violence and insufficient social network (Bask 2005). In more detail, inequalities that migrants risk in Sweden are lower material resources due to difficulties getting access to the labour market, which leads to social exclusion in the form of long-term unemployment (Bäckman and Franzén 2007) and dependency on social assistance (Gustafsson et al. 2007). People of foreign background can have problems maintaining the value of their education from their country of origin, and they risk getting lower position and salary than the native population (Bäckman and Franzén 2007). Other forms of social exclusion are limited access to the housing market, such that migrants are forced to rent their homes in poor, ethnically segregated neighbourhoods, i.e. suburbs of Stockholm, Göteborg and Malmö (Biterman and Franzén 2007). People who have migrated can have language problems that hamper contacts with institutions such as the employment agency, health and dental care services as well as socialization in the private sphere, for example in parental groups at school, networks in the neighbourhood and hobby organizations (e.g. clubs for physical activity, choirs or theatre groups).

Social determinants of health are closely related to power relations; one power relation is structural discrimination. Structural discrimination in society reduces the migrant population's opportunities for good health and well-being. How discrimination influences adults' health negatively from various perspectives has been shown in meta-analytic reviews revealing increased risk of anxiety and depression (Williams et al. 2003) or engagement in health risk behaviours such as smoking and excessive drinking (Pascoe and Smart Richman 2009). This has also been found in a Swedish study (Wamala et al. 2007) where discrimination is suggested as a proxy for stress. There is a historical connection between systematic racism in medical science, medical practice and the concept of the "others"

(Mulinari 2004). Discrimination and ill health lead to morbidity and mortality among the part of the population who have undertaken a migration (Mulinari 2004). De los Reyes and Mulinari (2005) claim that asymmetric power relations stigmatize, discriminate and limit individuals and certain subgroups of people's autonomy. Women who have migrated might be at risk of multiple social exclusion due to differences in the social construction of culture and gender in the country of origin, and the country of destination (Llácer et al. 2007). If there is a huge difference in the social constructions of culture and gender, for example if the women were housewives and the men had the authority to take decisions alone for the family in the country of origin, it can cause distortions of the social constructions of gender in the country of destination (Llácer et al. 2007).

Foreign extraction

Parental background

In this thesis children of two foreign-born parents are categorized as of foreign background, children of one foreign-born and one Swedish-born parent are classed as of mixed background and children of two Swedish-born parent are named as of Swedish background. That categorization is equal as the one used in the Swedish part of the WHO-HBSC survey (SNIPH, 2011) and Save the Children (Salonen 2012). This categorization is similar but not identical to that of Statistics Sweden (SCB) (SCB 2012), since SCB does not make a distinction between whether one or both parents are foreign-born. According to SCB you have a foreign background if you are foreign-born or are an offspring of two foreign-born parents. Since 2003, those of one foreign-born and one Swedish-born parents have been counted as of Swedish background, but before 2003 they were counted as being of foreign background. However, the category of one foreign-born and one Swedish-born parent, named mixed background in this thesis, is not used by the SCB. Aspinall (2000a and 2000b) claims that ethnicity should be self-defined only, because ethnicity and culture are dynamic social constructions. No questions regarding cultural or ethnic belonging were included in the questionnaire. It is necessary to give boys and girls of mixed background their own category as they have health and life circumstances that differ from both those of foreign background and those of the majority population (Aspinall 2000b; Fryer et al. 2008). If we had included children of mixed background in either of the two other subgroups, their unique health and life circumstances would have risked being hidden. Few of the children in Swedish are foreign-born themselves. When Save the Children categorizes children into two groups, children of foreign background and children of mixed background are aggregated into one group and classed as being of foreign extraction, and children of two Swedish-born parents are class as being of Swedish

background. In Sweden the proportion of boys and girls of foreign extraction is around one fourth of the total number of children (Salonen 2012).

How social constructions of cultures influence the health of adolescents of foreign extraction

For adolescents of foreign background, i.e. two foreign-born parents, the social context also includes influences of their parents' culture of origin (Fryer et al. 2007; Holmberg and Hellberg 2008; Weden and Zabin 2005). Children of foreign background probably deal every day with at least two sets of social constructions of culture: (1) the set of social constructions of culture from their parent's country of origin and (2) the Swedish set of social constructions of culture (cf. Burr 1995). Dealing with at least two sets of social constructions of culture can have advantages, such as the ability to move independently between the sets of social constructions of culture according to which of them is most convenient and has most advantages (Gustafson 2007). On the other hand, this dealing with several sets of social constructions of culture may generate feelings of alienation, absence of belonging to any of the sets of social constructions of culture, with the risk of developing a rootless identity (Gustafson 2007). However, most adolescents who grow up in a Western country seek their own identity (Jessor 1991). Some adolescents might not be able to cope with the social constructions of their parents' country of origin, because they do not know their contents or roots, as they probably have become acquainted with them for real just a few times during their childhood, for example on journeys to their parents' country of origin (Eastmond and Åkesson 2007). Juang and Moin Syed (2010) claim that a sufficient family identity developed during the adolescence period is of great importance, especially for boys and girls of foreign background (Juang and Moin Syed 2010). Finally, social constructions are not a static heritage but continual constructions and reconstructions in relation to dynamic processes in the current society (Burr 1995).

The social context for adolescents of mixed background, i.e. one foreign-born and one Swedish-born parent, also make sense for health (Fryer et al. 2008; van Tubergen and Poortman 2010). According to Fryer et al. (2008), children of mixed background might be exposed to certain fragility, for example lack of self-evident social belonging to a peer group. The formation of the personal identity is complex for children of mixed background and includes a struggle to choose one of the parents set of social constructions of culture or both. The choice of belonging to one of the parents' set of social constructions of culture can change during childhood and adolescence (Doly and Kao 2007). However, in-depth interviews with children in Poland show that most children of mixed background cope well with their

parents' different sets of social constructions of culture and are successful in developing a sense of dual belonging (Evergeti and Zonitini 2006).

Social determinants that influence boys' and girls' health and health risk behaviours

Marmot (2006) claims that most of the diseases follow the social gradient, as lower social gradients mean higher risk of diseases such as stroke, heart infarction, lung diseases, HIV-related diseases, injuries and violent death (Marmot 2006). Lynch and Kaplan (2000) describe how the socioeconomic position can influence health during the whole life course, from foetus to old age. For example, the way educational and environmental conditions during childhood influence lifestyle behaviours such as smoking, dieting and exercise predetermines the likelihood of arteriosclerosis and increases the risk of cardiovascular diseases (CVD) (Lynch and Kaplan 2000). Health risk behaviour (HRB) can function as one of several mediators between SES and ill health (Marmot 2006). Dahlgren and Whitehead (2007) suggest an equity-oriented public health policy through democratic processes with a focus on increasing the possibilities to live a healthy life, e.g. reduction of income inequities, health promotion programmes at school that support vulnerable families and strategies for reduced social inequity in deprived neighbourhoods (Dahlgren and Whitehead 2007).

Family affluence and place of living

Associations between the children's health and well-being and family affluence have been shown in previous research, such as increased risk of SHC (Reinhardt and Madsen 2002), as well as increased risk of verified diseases (Vinnerljung et al. 2007). Two Swedish definitions of child poverty are: (1) low income (not enough money to pay for housing, food, clothes and so on) or in need of social assistance (Salonen 2012), (2) when their parents have an income less than 50% of current median income (Lindquist and Sjögren Lindquist 2010). Almost three of ten children with a single parent, compared to one of ten with two parents, are exposed to child poverty (according to the first definition by Salonen ((2012). There are huge differences in child poverty between children of Swedish background and children of foreign extraction. Almost one third of children of foreign extraction compared to around six percent of children with a Swedish background were year 2009 living in child poverty (Salonen 2012). The most disadvantaged situation was found for children of foreign extraction living in some of the segregated metropolitan areas of Stockholm, Göteborg or Malmö. For example, in 2009 child poverty was 64% in Rosengård (a suburb of Malmö), and 97% of those children were of foreign extraction (Salonen 2012). Fifty-three percent of children of foreign

extraction in Sweden who live with a single parent are exposed to child poverty (Salonen 2012).

There are distinct differences between temporarily poor and chronically poor children (Lindquist and Sjögren Lindquist 2010). Temporarily poor children are defined as those who have been poor less than six years. Those children's parents have had periods of unemployment or sick leave, have been students at university or single parents for a while. Almost half of the children have been poor during at least one year of their childhood. These children are not at increased risk of adult poverty (Lindquist and Sjögren Lindquist 2010). Chronically poor children have been poor more than seven years, and these children's parents have had long periods of unemployment, have low education or are foreign-born (Lindquist and Sjögren Lindquist 2010). Two percent of the children in Sweden are identified as chronically poor and they are at increased risk of adult poverty (Lindquist and Sjögren Lindquist 2010). The reason behind the huge differences in the number of temporarily and chronically poor children is the successful Swedish family policies in combating child poverty. However, there is still a need for actions against chronic poverty among children of migrant parents (Lindquist and Sjögren Lindquist 2010). A systematic review regarding neighbourhood context and child health and well-being shows an increased risk of ill health, such as low birth weight and behavioural problems if the child was growing up in a socially deprived (poor) neighbourhood (Sellström et al. 2008).

Family structure

Living with one or two parents during childhood is an issue that has at least two dimensions, the economic one and the relational one, and both can influence health. According to the Swedish version of the WHO-HBSC survey in 2009/10, about three fourths of children live together with both parents or in shared custody (SNIPH, 2011). Cross-national studies (with all Nordic countries included) of children's life satisfaction in relation to family structure and family affluence show that the negative impact of not living with two parents was negligible compared to the negative impact of low family affluence (Bjarnason et al. 2012). A cross-national study shows that children of migrant parents are just likely as or more likely than the majority population to live with two parents (Hernandez et al. 2010). However, Sweden was not included in that study. Growing up with a single parent increases the risk of economic vulnerability and weakens social relations between the child and the parent (Vinnerljung et al. 2007). Increased risk of mental disorders, alcohol-related diseases and attempted suicide have been shown in girls growing up in single-parent households, while no such increased risks were found in boys (Vinnerljung et al. 2007). Single parents risk having less time for their children,

because they have no one to share economic duties and household responsibility with. However, most children of single parents have good health and well-being (Vinnerljung et al. 2007).

Health risk behaviours

> *"… in too much of the discourse in this field there has been a failure to recognize the fundamental role of socially organized poverty, inequality, and discrimination in producing and maintaining a population of at-risk youth… (Jessor, 1991, p. 597)"*

Low family affluence is not only associated with SRH (Ravens-Sieberer et al. 2009; Torsheim et al. 2006; Östberg et al. 2006) but also with health risk behaviours (HRB) among adolescents (Richter et al. 2006; Richter et al. 2009). Components in the social context, such as relations with parents and peers, racial inequalities, gender, economy and school environment influence social behaviours, and the ways in which adolescents approach HRB (Fryer et al. 2008; Richter et al. 2009). The HRB selected in this thesis, i.e. drunkenness, smoking, wish to lose weight, low physical activity, inadequate tooth brushing, low vegetable consumption and high soft-drink consumption, have been shown in previous research to predict chronic morbidity and prior mortality. The HRB were chosen because they contribute to the burden of public diseases. For example the burden of cancer, heart disease and stroke is connected to lifestyle behaviours, such as high alcohol consumption, which increases the risk of liver cancer (Jessor, 1991). More risk factors that are associated with cancer are smoking, low physical activity and overweight /obesity due to e.g. low vegetable consumption and high fat consumption (Wardle et al. 2003). High intake of carbohydrates, for example soft drinks, increases the risk of type 2 diabetes (Verzeletti et al. 2010). Imbalance in eating and weight control behaviours displays associations with anorexia and bulimia nervosa (Mackey and La Greca 2007). Inappropriate tooth brushing (less than twice a day) and oral hygiene increase the risk of dental caries, and dental caries is the most common chronic infection that increases the risk of periodontal disease (Boyce et al. 2010). Current research shows associations between periodontal disease and arteriosclerosis; the author claim that caries should be investigated as an independent risk factor for arteriosclerosis (Zoellner 2011) An Italian literature review on dental health and cardiovascular diseases (CVD) shows similar results and concludes that there seem to be associations between periodontal disease and CVD (Cotti et al. 2011).

Previous research shows associations between low SES and HRB. Negative associations are shown between low SES and low physical activity, low vegetable

consumption (Wardle et al. 2003) and high soft-drink consumption (Vereecken et al. 2005). The surrounding area influences adolescents' HRB, and smoking seems to be the most predictable HRB for engagement in other HRB (Wardle et al. 2003). Smoking is more socially accepted in poor than in wealthy neighbourhoods (Wardle et al. 2003). Associations between parental length of education, smoking and inappropriate tooth brushing have been found in adolescents (Honkala and Honkala 2011). The lowest proportion of daily smokers with inappropriate tooth brushing behaviour has been found in children of parents with upper secondary school/university and the highest proportion in children of parents with vocational high school (Honkala and Honkala 2011). Tooth brushing frequency and dental health are strongly connected to ill health and low socioeconomic status (Boyce et al. 2010; Honkala et al. 2007; Honkala and Honkala 2011; Julihn et al. 2010; Perera and Ekanayake 2010; Wamala et al. 2006). Other factors associated with tooth brushing frequency and dental health are self-esteem, life-satisfaction, school-satisfaction (Honkala et al. 2007) and food habits (Perera and Ekanayake 2010). A cross-national study of episodes of drunkenness and SES shows limited evidence for any relationship between low FAS and repeated episodes of drunkenness among adolescents (Richter et al. 2006). That study shows no association between SES and episodes of drunkenness in girls in Sweden, while there was a positive association between low FAS and episodes of drunkenness in boys (Richter et al. 2006).

Previous research shows some gender differences in HRB. The literature is in agreement that girls have more appropriate tooth brushing behaviour and mouth hygiene than boys (Boyce et al. 2010; Honkala, et al. 2007; Honkala and Honkala 2011; Julihn et al. 2010; Perera and Ekanayake 2010; Wamala, et al. 2006). Girls consume more vegetables (Wardle et al. 2003) and less soft drink (Vereecken et al. 2005) than boys. Boys are more physically active than girls (Haug et al. 2008; Kahlin et al. 2009; Wardle et al. 2003). Girls are more engaged in dieting behaviours than boys (Bonino et al. 2005; Gillander Gådin and Hammarström 2005; Huang et al. 2007), and dieting can be associated with bullying (Meland et al. 2010). However, self-esteem, body satisfaction and wish to lose weight correspond with body mass index and overweight as well (Huang et al. 2007).

Degrading treatment at school

The Swedish school Act (SFS 2010:800, chapter 6) uses the term degrading treatment when dealing with discrimination in general. Asymmetric power relations expressed as degrading treatment, such as bullying, are a frequent problem in schools that have a negative influence on the psychosocial environment and pupils' health (Eliasson et al. 2005; Gillander Gådin and Hammarström 2005;

Gustafsson et al. 2010; SNAE 2009). There is inconsistency in the literature as to whether there are any associations between parental background and bullying involvement. Some studies claim that children of foreign extraction are more involved as victims than children of the majority population (Lambert et al. 2008; Westin 2003), while other studies show no clear trends due to foreign extraction (Vervoort et al. 2010). However, just one of those studies (Westin 2003) had a Swedish context. All three studies are in agreement that boys are more involved in bullying than girls, regardless of parental background. A US literature review on health and socioeconomic status among children shows associations between mental health, aggressive behaviour (such as bullying) and low material welfare in the family (Currie 2009). Adolescents who are involved in bullying, irrespective of whether they are bullies, victims or bully/victims, suffer from decreased health (Srabstein and Piazza 2008; Gobina et al. 2008) and well-being (Gustafsson et al. 2010; Meland et al. 2010; Schnohr and Niclasen 2006; Unnever 2005). Aggressive behaviour is seen as a strong predictor of bullying involvement but it interacts with the social environment (Gustafsson et al. 2010; Unnever 2005).

The social context of school and participation

As all children spend their weekdays at school, the school and its environment is an important arena for health promotion (Gillander Gådin et al. 2011) and reduction of inequities in health and well-being due to differences in socioeconomic status (West and Sweeting 2004). For example, a Canadian study shows advantages of activities where the children themselves identify the health issues that concern them. When using participatory methods the children take active part in figuring out how existing inequities in social determinants influence their health (Woodgate and Leach 2010). The school functions as a social arena where boys and girls practise and reproduce gender and other power relations. Previous research claims that participation, such as taking part in democratic processes, cooperation in the class and equal weight in communication, has advantages for the pupil's progress, for example decreased bullying and increased social and academic skills (Ahlström 2010). The atmosphere in the classroom is important for students' participation and can be measured as school warmth (Voelkl 1995). School warmth illuminates how the students perceive the teachers' engagement such as supporting the students in a positive manner and listening to them. Further, the researcher of that study (Voelkl 1995) found that participation was a mediating factor between school warmth and the students' academic achievement. A Swedish study of high school girls reported that asymmetric power relations, expressed as bullying, sexual harassment, and ethnic harassment were regarded as problems at school even if they were not exposed as individuals (Witkowska and Menckel 2005).

Motives for this study

There is a lack of research, at least in Sweden, focusing on health among boys and girls who have migrated parents. There is also a gap in the Swedish literature regarding associations between SRH, family affluence and health risk behaviour focusing on foreign extraction and taking gender into account. Few previous Swedish studies have investigated bullying involvement categorizing children as bullies, victims and bully/victims. No previous research has been found investigating whether experience of discrimination is a mediating factor between participation and self-rated health. This thesis focuses on the children's present situation, as most boys and girls of migrant parents are Swedish-born, as migration is an action, not a personal quality that can be inherited generation by generation (Peralta 2005). This thesis takes an intersectional perspective into account with ambitions to be able to emphasize the interplay between different power relations (i.e. gender, social class and parental background (Lykke 2005)). As gender is suggested as one of the most pervasive power dimensions in society (Connell 1987), separate analyses based on gender were necessary.

AIM OF THE THESIS

The main aim of this thesis was to investigate health and social determinants among boys and girls in Sweden with a focus on parental background.

The specific aims were to analyse:

- the associations between foreign extraction and subjective health complaints among school-aged children in Sweden (I).

- how health risk behaviours are clustered and associated with parental background and family affluence among Swedish boys and girls (II).

- how bullying involvement is associated with the distribution of parental background and with subjective health complaints (SHC) among Swedish boys and girls (III).

- associations between occurrence of discrimination at school, participation and psychosomatic problems (PSP) among boys and girls in northern Sweden, and whether discrimination is a mediating factor (IV).

MATERIAL AND METHODS

Design

The thesis comprises four papers. The papers have a cross-sectional design and are from two different data sets. For papers I–III the Swedish part of the WHO-HBSC survey was used, including boys and girls in grades five, seven and nine. Paper IV was based on regional data from a municipality in northern Sweden, including boys and girls in grades six to nine. The fourth paper where regional data was used illustrates more deeply the school environment in relation to boys' and girls' health. The quantitative method was chosen in order to explore and study how associations between health and its related factors are allocated in sub-groups of pupils and to be able to generalize the results in a Swedish context. An overview of the aims, study populations and methods of the papers is shown in Table 1.

Table 1. Overview of aims and methods of the included papers (I–IV)

	Paper I	**Paper II**	**Paper III**	**Paper IV**
Aim	To explore the associations between foreign extraction and SHC among school-aged children in Sweden	To analyse how health risk behaviours are clustered and associated with parental background and family wealth among Swedish boys and girls	To analyse how bullying involvement is associated with the distribution of parental background and with SHC among Swedish boys and girls	To analyse associations between occurrence of discrimination at school, participation and PSP among boys and girls in northern Sweden, and whether discrimination is a mediating factor
Design	Cross-sectional classroom surveys			
Study population	The Swedish part of the WHO-HBSC survey, 1997/98, 2001/02 and 2005/06, 11,972 pupils in grade 5, 7 and 9			Ten schools in a municipality in northern Sweden 2011, 1527 pupils in grades 6–9
Population size	11,972			1527
Instruments	SHC, FAS	FAS	SHC, FAS	PSP, SOCS
Statistical methods	Multivariate logistic regression	Cluster analysis, Multinomial logistic regression	Multivariate logistic regression	Multivariate logistic regression, Mediating formula

Material, data collection and target population

Health behaviour in school-aged children (I–III)

The analyses for paper I–III were carried out on data obtained from the Swedish National Institute of Public Health's (SNIPH) survey entitled Swedish School Children's Health Behaviour, which is a part of the World Health Organization's (WHO) global survey entitled Health Behaviour in School-aged Children (HBSC). The WHO-HBSC survey started at the beginning of the eighties as an investigation of tobacco consumption among boys and girls in Finland, Norway, England and Austria. Since 1985/86 the survey has been conducted continuously every four years. Swedish boys and girls have participated since 1985/86 (Danielson 2003). More than 40 countries participated in the last survey in 2009/10 (Currie et al. 2012). The survey follows the WHO-HBSC international standards (SNIPH 2011). In Sweden the data collection takes part in November–December (Danielson 2003).

Pupils in grades five, seven and nine (in Sweden this equals 11, 13 and 15 years old) are asked to answer the questionnaires during their ordinary school classes; their participation is voluntary and anonymous. The Swedish sampling method for participating pupils was carried out in a two-step cluster design. First, a national representative cluster of schools was randomly selected. Second, a selection of schools or classes in each grade was included in the study with aim of reaching at least 1500 pupils in each grade (Danielson 2006). A letter of agreement was sent to all parents with a request for their signature and to send it back to the school only if the parents had any objection to their child's participation in the survey. The teachers were given necessary support via telephone and e-mail during the period of data collection. In the present study, the years of measurement 1997/98, 2001/02 and 2005/06 were selected for the analyses because those years include questions about the country/region of birth for both the pupils and their parents. In measurement years 1997/98 and 2001/02 the country of birth was categorized: (1) Sweden, (2) a Nordic country (except Sweden), (3) a European country (except the Nordic countries) or (4) a country outside Europe. For measurement year 2005/06 country of birth was an open-ended question, and thus country of birth was categorized as in 1997/98 and 2001/02, with European countries defined according to the Swedish National Encyclopedia (NE 2008). However, the relatively low proportion of children of foreign extraction does not allow advanced analyses according to these four categories. In total 11,972 (n 6054 boys and n 5918) girls participated in those years of measurement. The response rate varied between 85 and 90% (Danielson 2006). For a description of the children and their parental background see Table 2.

Table 2. Country of birth of children and their parents (I–III)

	Parental background % (n)	Foreign born pupils % (n)
Total	**100 (11972)**	**6.2 (737)**
Pupils of two Swedish-born parents	**80.0 (9585)**	**1.1 (134)**
Pupils of one Swedish-born and one foreign-born parent	**10.6 (1263)**	**0.8 (90)**
One Swedish and one Nordic-born parent	4.8 (579)	0.2 (24)
One Swedish and one European-born parent (Nordic excluded)	3.1 (367)	0.2 (25)
One Swedish and one parent born outside of Europe	2.6 (317)	0.4 (41)
Pupils of two foreign-born parents	**9.4 (1124)**	**4.3 (513)**
Both parents Nordic-born (Swedish excluded)	1.0 (115)	0.2 (25)
Both parents European-born (Nordic excluded)	2.7 (328)	1.5 (182)
Both parents born outside of Europe	5.0 (597)	2.3 (279)
Other combinations of two foreign-born parents	0.7 (84)	0.3 (27)

School health promotion project in Östersund (IV)

A three-year school health promotion project coordinated by the SNIPH started in Östersund in 2009. The projects aim was to develop health-promoting methods among pupils in secondary school. The Municipality of Östersund has about 60,000 inhabitants (SCB 2012), the most common occupations are in the private sector such as tourism and trading 57%, and public services, such as school, health care and social services 30% (SALAR 2012). Fewer inhabitants in Östersund are foreign-born, about 6%, than the average population in Swedish, about 15% (SCB 2012). Östersund is the only densely populated area in the county. The county covers a huge area with forest and mountains. The present study includes ten schools in the municipality of Östersund. In the present study the measurement year 2011 was chosen as a cross-sectional cohort. Boys and girls in grades six to nine (in Sweden equal to 12–15 years old) were invited to answer a web-based questionnaire regarding their health and the psychosocial school environment in January 2011. This data collection follows the same standard for voluntary and anonymous participation as papers I–III. In total 1527 pupils, (boys n 729 and girls n 798) answered the questionnaires, with a response rate of 80%. The distribution of parental background was: 85.6% (n 1296) Swedish background, 9.0% (n 136) mixed background and 5.2% (n 79) foreign background. The proportion of children who were foreign-born themselves was 5.6% (n 84).

Measures

Dependent variables

In papers I and III the boys' and girls' health was measured by the Symptom Check List (SCL) which comprises eight subjective health complaints (SHC). SHC includes four psychological symptoms: feeling low; irritable, or bad tempered; feeling nervous; difficulties in getting to sleep. It also included four physical symptoms: headache; stomach ache; backache; feeling dizzy. The respondents rated the frequency of symptoms during the last six months. There were five answer options: seldom, once a month, once a week, more than once a week and almost daily (Haugland et al. 2001). The scores were summarized in an index ranging from eight to forty and dichotomized, i.e. the highest symptom quartile (coded 1) versus the three lowest symptom quartiles (coded 0) (Gillander Gådin and Hammarström 2005; Hagquist 2007), the cut-off point was set at 27. Test-retest of the SCL shows that all included eight items had an adequate intraclass correlation coefficient, ranging from 0.61–0.75 (Haugland and Wold 2001). Validation of the SCL by Rasch analyses also shows that the instrument has an adequate fit (Hagquist and Andrich 2004).

Seven HRB were selected (II) and used as dichotomous variables for test of interaction and confounding and as categorical variables in the cluster analysis. The included HRB were: drunkenness, smoking, wish to lose weight, low physical activity, inadequate tooth brushing, low vegetable consumption and high soft-drink consumption (Table 3). The single HRB ended up in five clusters: low risk behaviour, wish to lose weight, inadequate tooth brushing, drunkenness and multiple risk behaviour.

The PsychoSomatic Problems (PSP) scale (IV) was used to measure the boys' and girls' health and has similarities with the SCL (I & III). This instrument likewise measures frequencies of eight psychosomatic symptoms during last six months. The symptoms included were: suffered from stomach ache; suffered from headache; had a little appetite; felt dizzy; felt sad; had difficulty in sleeping; had difficulty in concentrating; felt tense. The five answer options were: never, seldom, sometimes, often and always. The scores were summarized in an index ranging from 0–32 and dichotomized, i.e. the highest symptom quartile (coded 1) versus the three lowest symptom quartiles (coded 0) (Gillander Gådin and Hammarström 2005; Hagquist 2007), with the cut-off point set at 14. The PSP scale has been validated with Rasch analysis, showing no gender difference in item functions (Hagquist 2008).

Table 3. Description of the seven health risk behaviours (HRB) used for cluster analysis (II)

Original questions for the HRB	Answer options and categorical variables	Dichotomizing reference = 0, at risk = 1
Have you ever in your lifetime been real drunk?	"No, never", "yes, once", "yes, two – three times", "yes, fourteen times" and "yes, more than ten times".	"No, never" and "yes once" = 0. "Two–three times" to "yes, more than ten times" = 1 (Richter et al. 2006).
How often are you smoking now a day?	"I do not smoke", "less than once a week", "more than once a week but not daily" and "daily".	"I do not smoke" and "less than once a week"= 0. "More than once a week but not daily" and "daily" = 1 (Richter et al. 2009).
Measurement year 1997/98 "At present are you on diet?"	"No", "no but I ought to" and "yes".	"No"= 0. "No but I ought to" and "yes" = 1.
Measurement year 2001/02 and 2005/06 "At present are you on diet or doing something else to lose weight?"	"No", "no but I ought to increase my weight", "no but I ought to reduce my weight" and "yes". ("no but I ought to increase my weight" was re-coded into the category of "no" in this step).	"No"= 0. "No but I ought to increase my weight", "no but I ought to reduce my weight" and "yes" = 1.
How many hours per week out of school time do you exercising until getting out of breath or sweaty?	"Seven hours or more", "four–six hours", two–three hours", "one hour", "half an hour" and "never".	"Seven hours or more", "four–six hours", two–three hours", "one hour" = 0. "Half an hour" and "never"= 1 (Haug et al. 2009).
How often do you brush your teeth?	"More than once a day", "once a day", "at least once a week but not daily", "less than once a week" and "never".	"More than once a day"= 0. "Once a day", "at least once a week but not daily", "less than once a week" and "never" = 1 (Honkala et al. 2007).
How many times a week do you eat vegetables?	"More than once a day", "once a day", "five–six days", "two–four days", "once a week", "less than once a week" and "never".	"More than once a day" and "once a day" = 0. "Five–six days", "two– four days", "once a week", "less than once a week" and "never" =1 (Haug et al. 2009).
How many times a week do you drink soft drinks?	"More than once a day", "once a day", "five–six days", "two–four days", "once a week", "less than once a week" and "never".	"Never", "less than once a week", "two–four days", "once a week" and "five–six days"= 0. "Once a day" and "more than once a day" = 1 (Haug et al. 2009).

Explanatory variables

In all four papers (I–IV) the pupils' and their parents' background was elicited by questions about country of birth. Subgroups were defined according to the categorization by Vinnerljung et al. (2007) (cf. Salonen 2012; SNIPH 2011). The categorization was as follows two Swedish-born parents = Swedish background (coded 0), one Swedish-born and one foreign-born parent = mixed background (coded 1) and two foreign-born parents = foreign background (coded 2). When boys and girls of mixed background and foreign background are mentioned together the term foreign extraction is used.

Family affluence (I–III) was measured with the socioeconomic instrument developed by the WHO-HBSC survey, named Family Affluence Scale (FAS) (Currie et al. 1997), which comprises four questions. "Do you have your own bedroom for yourself?" (No = 0/yes = 1). "Does your family own a car, van or truck?" (No = 0/yes, one = 1/yes two or more = 2). "How many computers does your family own?" (None = 0/one = 1/two or more = 2) "During the past twelve months, how many times did you travel away with your family?" (Not at all = 0/once = 1/twice or more = 2). The scores were transformed into an index (0–7) and trichotomized into: 6–7 = High FAS (coded 0), 4–5 = Middle FAS (coded 1) and 0–3 = Low FAS (coded 2) (Currie et al. 2004). Validations show that FAS is more suitable for assessment of material welfare in the family than parental education or occupation, as children of poor families to a higher degree had problems reporting parental education or occupation (Wardle et al. 2002). The FAS instruments show adequate internal reliability and good external validity (Wardle et al. 2002). In paper IV family affluence was measured with the question "If you consider your situation in the past six months, have you had enough money to be able to do the same things as your friends?" The answer options "always" and "often" were coded 0 and "sometimes", "rarely" and "never" were coded 1.

Bullying (III) was measured with two questions regarding frequency of bullying involvement during the last month. How often have you been bullied or bullied others? The answer options were, "never", "once or twice", "two–three times a month", "around once a week" and "several times a week". The answer option "never" was coded 0, all other answer options were coded 1. The boys and girls who had been involved as both bullies and victims were coded 3 according to Bauer et al. (2006).

Table 4. Questions and answer options in the Social and Civic Objectives Scale (IV)

Components	
Communication	Do you think that your classmates listen to others' opinions? Are your classmates good at explaining what they mean? Do you think your classmates express their opinions in such a manner that makes other people listen? Do the majority of students participate in discussion during class?
Democratic competence	Do you think that your classmates dare to stand up for their opinions? Do you think that your classmates respect the opinions of others? Do you think that you and your classmates have the ability to compare and critically review facts?
Cooperation	Do you think that your classmates believe that what you do has consequences for others? Do you handle solving conflicts in your class? Do you think your classmates are good at cooperation? Do you think that your classmates believe it is important to collaborate?
Answer options	"Yes, absolutely", "Yes, for the most part", "No, not usually", "No, not at all" and "I do not know".

The level of participation in the class (IV) was measured by the Social and Civic Objectives Scale (SCOS) (Ahlström 2010). The SCOS was developed from a larger questionnaire containing 52 questions, which used a student-centred approach with the aim of capturing the essence of social and civic objectives (Ahlström 2009). SCOS comprises eleven questions in three components where the student scores the atmosphere in the classroom and their classmates' social competence. The three components were named (1) *Democratic competence*, (2) *Communication,* and (3) *Cooperation.* Each question had six answer options, see Table 4. The single scores of each component were categorized into quartiles and coded as high, middle and low as follows: *Democratic competence* (score 3–18) 3–5, 6–9 and 10–18, *Communication* (score 4–24) 4–7, 8–11 and 12–24, *Cooperation* (score 4–24) 4–7, 8–12 and 13–24. Those individuals who were allocated to the high quartile in all three components were used as referents and coded 0; all others were coded 1. The SOCS instrument has been validated by Ahlström (2009).

Occurrence of discrimination (IV) was measured by frequency of discrimination at school during the last six months, with a discrimination index constructed of six questions (sex, culture or ethnicity, disability, religion or beliefs, sexual orientation

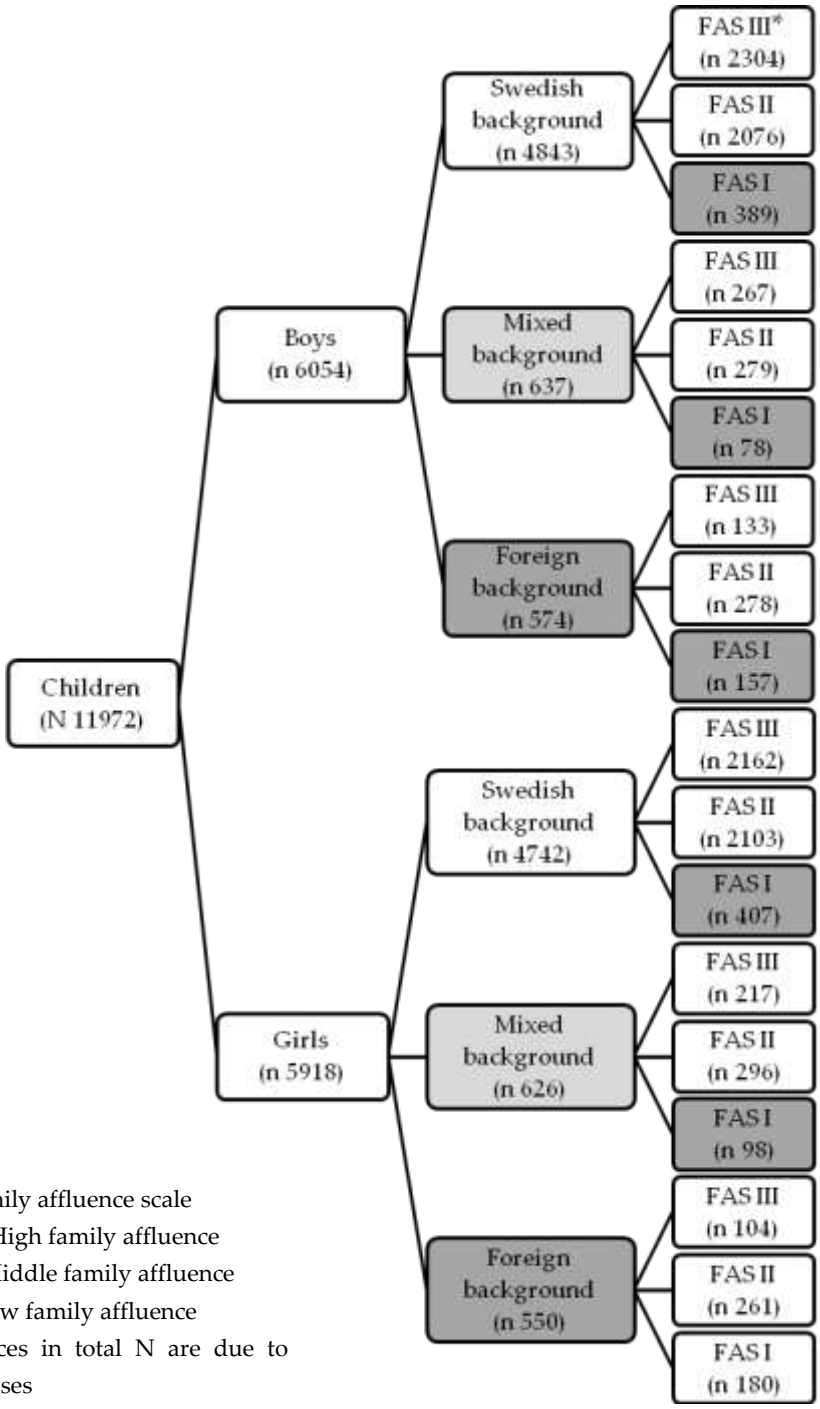
and any other form of discrimination) (Wamala et al. 2007). The questions had six answer options each. An index was constructed (Cronbach's α: 0. 96) and dichotomized into never–ever and coded; "never" = 0, "always", "often", "sometimes", "seldom" and "I do not know" = 1. The items in the discrimination index were almost identical (age was excluded) to the foundations in the Swedish Discrimination Act (SFS 2008:567).

Potential confounders

Potential confounding variables were the following variables from baseline:
– *place of residence* (I) was defined by the question "What sort of place do you live at?" The answer options "village" and "rural area" were coded 0, "urban", "suburban" and "town" were coded 1.
– *household structure* (I) was used as a socioeconomic variable. The boys and girls were categorized according to whether they were living with one or two adults in the household. Households with two adults (biological, social or step-parents) were coded 0 and those with one adult (single parent, living with grandparent or in family homes) were coded 1.
– *family structure* (III & IV) was used as a social variable. Boys and girls living with two parents (biological or social) were coded 0 and those living in other family structures (step-families, single parent, living with grandparent or in family homes) were coded 1.
– i) *grade* (I–III) was coded as: 5th = 0, 7th = 1 and 9th = 2.
– ii) *grade* (IV) were coded as: 6th = 0, 7th= 1, 8th = 2 and 9th = 3.
– *year of measurement* (I & III) was coded as: 1997/98 = 0, 2001/02 = 1 and 2005/06 = 2.

The intersectional model

According to how a model for categorical intersectional analyses should be methodologically built up, gender should be compared systematically (McCall 2005). Then the categories of social class and ethnicity should be added into the model one by one (McCall 2005). In the present study a categorical separation of boys and girls was made and parental background and FAS were added to the model (Figure 2). In papers I–III Figure 2 functions as an intersectional theoretical model to show the complexities of the mechanisms between the categories.



FAS = Family affluence scale
FAS III = High family affluence
FAS II = Middle family affluence
FAS I = Low family affluence
* Differences in total N are due to missing cases

Figure 2. The intersectional model (I–III)

Statistical analyses

Descriptive analyses

The analysis process was initiated with non-parametric tests, preferably Pearson's chi-square test for control of differences (1) between boys and girls, (2) between subgroups or clusters. The statistical significance level was set at five percent in papers I, III and IV, and one percent in paper II. Test of effect modification due to variation within the single variables and test of interaction effects due to unique qualities within the single variables (Bonita et al. 2006) were performed (I–IV). No potential effect modifications and interactions effects were shown in parental background and FAS. One reason for separate analyses for boys and girls is that gender is an analytical category (McCall 2005); the statistical reason is that interaction effects were shown between boys and girls and several of the included variables. Cronbach's alpha was calculated for tests of whether the discrimination index (IV) was suitable for further analyses (Pallant 2007).

Bivariate and multivariate logistic regressions (I, III & IV)

For the logistic regression analysis the outcome variables were dichotomized; zero (0) was the reference category and category one (1) was assumed as at risk (Körner and Wahlgren 2006). The explanatory variables were dichotomized or trichotomized; zero (0) was the reference category, categories one (1) and (2) were assumed as less advantaged than the reference category. Bivariate analyses according to the stratification model (Figure 2) and the outcome variables were used for estimation of crude risk. Different models of interaction terms were built up and considered before the final multivariate models with estimation of adjusted risk were accepted (Hosmer and Lemeshow 2000). Nagelkerke R Square was considered for degree of explanation of the multivariate models (Pallant 2007).

Cluster analyses (II)

The seven selected HRB were used as a base in the cluster analysis with the aim of defining clusters of HRB as a transformation from individuals' single HRB to more comprehensive profiles of subgroups of boys and girls. The cluster procedure started with a K-mean cluster analysis inspired by French et al. (2008) and Weden and Zabin (2005). At the first step in the K-mean cluster procedure all seven HRBs with the original answer options were included and transformed into z-scored variables. Initially 10 clusters were included, then the number of clusters was decreased step by step until the cluster solutions were stable and had enough individuals and each cluster had at least one HRB with a z-score >1 SD. The nearest centroid sorting method was used to define clusters (French et al. 2008), with the aim of reaching the nearest mean in each cluster by repeated iterations (Garson 2010). To ensure stability within the clusters, hierarchical cluster analyses with a

random sample of 33% of the data material were repeated with ten different random samples. Five random samples showed equality in the mean cluster centres. One was used as an initial cluster centre in the K-mean cluster analyses of the whole data material (Norušis 2010). Multivariate analyses were conducted using multivariate multinomial logistic regression.

As previous validations of some of the HRB showed design effect (Danielson 2003), such that there was risk that the boys and girls had been influenced by each other when they were completing the questionnaires, the recommended 1% significance level was set for regulation of the design effect in the logistical models. According to the WHO-HBSC report 2001/02 there was no risk of design effect regarding questions of health, such as self-rated health, life satisfaction or headache; regarding questions of health behaviour, for example drunkenness there was such a risk (Danielson 2003).

Multivariate multinomial logistic regression analyses (II)
When the boys' and girls' cluster allocation was defined by cluster analyses a multivariate multinomial logistic regression analysis was conducted. The statistical package runs the multinomial logistic regression by creating four binomial logistic regressions with the reference category (0) (Hosmer and Lemeshow 2000), in this case the cluster of low risk behaviour. As more than one explanatory variable was used, the term multivariate was used and the analyses were conducted separately for boys and girls.

Test of mediating factor (IV)
In paper IV a test of discrimination as a mediating factor between low participation and PSP was added to the analysis. A method suggested by Baron and Kenny (1986) was used. To test significance a Z-score was calculated, $Z = d/s(d)$, where d = the difference of the regression coefficients between model 1 and model 2. A Z-score > 2 ± SD was defined as significant (Stiles et al. 2000).

Ethics

Performing surveys on children includes several ethical concerns, for example, if it is harmful to ask sensitive questions regarding their health behaviours, such as smoking habits or episodes of drunkenness, and if some of the question risk additional stigmatization of vulnerable children. However, asking people below 18 years old sensitive questions about their health is not automatically unethical (Helweg-Larsen et al. 2003). Ethical concerns regarding how ethnicity should be categorized and identified are a serious issue (Parker and Roberts 2005). The authors claim that it is proper to make categories according to ethnicity/race but

that it is the individuals themselves who should define where they belong (Parker and Roberts 2005). The same opinion was put forward by Aspinall (2000b), who claimed that in public health research it is necessary for several reasons to define ethnicity but it should only be registered if it is of explicit benefit for the target population and defined by the individuals themselves. That opinion is supported by Norredam et al. (2011). Thereby boys and girls of foreign extraction were categorized into subgroups of foreign background and mixed background. The studies were carried out in accordance with good ethical practice in human research in line with the WHO Helsinki Declaration 1997 (Hermerén 2011). Papers I–III do not deal with personal data and do not require to be tested according to the Swedish Act concerning Ethical Review of Research Involving Humans (SFS 2003: 460). However, papers I–III were approved by the Mid Sweden University (MIUN) local ethics committee (dnr MIUN 209/362). The SNIPH is responsible for the WHO-HBSC survey in Sweden, but the SCB coordinates and carries out the data collection in practice. The local ethics committee at MIUN stressed that it was a weakness that the parents just were asked for passive consent to their child's voluntary participation in the survey. Paper IV was approved by the Umeå Regional Ethical Review Board as being in accordance with ethical standards of research (dnr 09-179M).

Table 5. Overview of significant findings in odds ratios (OR) and confidence intervals (CI) (I−IV)

	Boys				Girls			
	SHC[i]	**PSP[ii]**	**Multiple HRB[iii]**	**Inade-quate tooth brushing**	**SHC**	**PSP**	**Multiple HRB**	**Inade-quate tooth brushing**
	OR (CI) (I, III)	**OR (CI) (IV)**	**OR (CI) (II)**	**OR (CI) (II)**	**OR (CI) (I, III)**	**OR (CI) (IV)**	**OR (CI) (II)**	**OR (CI) (II)**
Mixed background	ns.*	2.94 (1.46–5.92)	1.67 (1.05–2.64)	ns.	ns.	ns.	1.91 (1.28–2.85)	ns.
Foreign background	ns.	ns.	ns.	1.82 (1.34–2.47)	1.27 (1.04–1.55)	ns.	1.67 (1.06–2.64)	1.95 (1.35–2.83)
Bullies	1.77 (1.45–2.16)	–	–	–	1.95 (1.58–2.41)	–	–	–
Victims	2.0 (2.45–3.67)	–	–	–	2.44 (2.05–2.91)	–	–	–
Bully/victims	3.84 (3.02–4.87)	–	–	–	4.51 (3.18–6.40)	–	–	–
Low participation	–	1.98 (1.11–3.54)	–	–	–	2.16 (1.34–3.28)	–	–
Discrimination	–	1.89 (1.02–3.50)	–	–	–	2.19 (1.40–3.44)	–	–
Low FAS	ns.	–	ns.	ns.	ns.	–	1.99 (1.29–3.06)	1.69 (1.16–2.46)
Less money than friends	–	2.55 (1.46–4.47)	–	–	–	2.00 (1.32–3.03)	–	–
Single adult household	ns.	–	–	–	1.42 (1.20–1.67)	–	–	–
Other family[iv] constellations	ns.	–	–	–	1.43 (1.23–1.65)	–	–	–

[i] Subjective health complaints, [ii] Psychosomatic Problems, [iii] Multiple health risk behaviour, [iv] Living in other family constellations than with two parents, * Not significant, – Not applicable

RESULTS

Table 5 shows significant findings of risk factors for SHC or PSP for all boys and girls regardless of parental background: those with any form of bullying involvement (III), not enough money to do the same things as friends (IV), low participation and experience of discrimination at school (IV), with the latter also being a mediating factor for PSP (IV). An additional risk factor for girls was living with one parent (I & III). The girls showed increased risk of SHC (I & III) and PSP (IV) in grades seven and nine; among boys the increased risk of SHC (I & III) was elevated in grade nine only (not shown in table). Several indicators of increased risk among boys and girls of foreign extraction as compared to boys and girls of Swedish background were shown. Girls of foreign background were at increased risk of SHC (I) and boys of mixed background were at increased risk of PSP (IV). Increased risk of allocation to the cluster profile of multiple risk behaviour was found in girls of low FAS, in boys and girls of mixed background and in girls of foreign background (II). Increased risks of allocation to the cluster profile of inadequate tooth brushing were shown in girls of low FAS and in boys and girls of foreign background (II).

Paper I: Subjective health complaints (SHC) among boys and girls in the Swedish HBSC study: focussing on parental foreign background

The first paper showed an increased risk of SHC among girls with a foreign background compared to girls with a Swedish background. Increased risk of SHC was shown in girls in single-adult households compared with girls in two-adult households (Table 5). No such differences were shown among boys. Huge differences were shown in FAS. About 30% of the boys and girls with a foreign background had low FAS, in the middle were the boys and girls with a mixed background 14%, but only 8% of the boys and girls with a Swedish background have low FAS ($p = <0.001$).

Paper II: Risk behaviour, parental background and wealth – a cluster analysis among Swedish boys and girls in the HBSC study

The second paper shows that in total 11,232 pupils were identified and allocated to five cluster profiles, 50.8% (n 5791) of them to the cluster profile of low risk behaviour, with an equal proportion of boys and girls ($p = 0.068$). The smallest and most disadvantaged cluster was multiple HRB, 6.1% (n 691). The cluster profile of multiple HRB was characterized by high prevalence of smoking (97.5%),

drunkenness (82.6%), low physical activity (34.4%) and high soft-drink consumption (37.9%). The cluster profile of multiple HRB was associated with both mixed background and foreign background in girls and with mixed background in boys. The cluster profile of inadequate tooth brushing (14.1%, n 1612) was associated with foreign background in both boys and girls. Among girls low family affluence was associated with the cluster profiles of multiple HRB and inadequate tooth brushing (Table 5). Girls were overrepresented in the clusters of wishing to lose weight (n 1524 out of 2496, p = <0.001) and multiple HRB (n 391 out of 691, p = <0.001) and boys were overrepresented in the cluster profiles of inadequate tooth brushing (p = <0.001) and drunkenness (n 455 out of 803, p = <0.001). The cluster profiles of wishing to lose weight and drunkenness did not shown associations with FAS or foreign extraction in boys or girls. Less than a half percent of the boys and girls in grade five were allocated to the cluster profiles of drunkenness (n 16) or multiple HRB (n 11).

Paper III: How bullying involvement is associated with the distribution of parental background and with subjective health complaints among Swedish boys and girls

The third paper shows that the frequencies of bullying involvement once or more were: none involved (74.8%), victims (10.6%), bullies (10.3%) and bully/victims (4.4%). Six out of ten involved in bullying were boys. Boys of foreign background were more involved as bullies compared to boys of mixed or Swedish background (p = <0.001). Girls of foreign background were involved in all three categories of bullying – victims (p = 0.022) bullies (p = <0.001) and bully/victims (p = <0.002) – more than girls of mixed or Swedish background. Increased risk of SHC was estimated among all adolescents involved in bullying regardless of parental background (Table 5), and the results were stable even after adjustments for socio-demographics. Highest risk of SHC was estimated in the category of bully/victims, OR 3.84 (95% CI 3.02–4.87) for the boys and OR 4.51 (95% CI 3.18–6.40) for the girls. The only socio-demographic factor that showed remaining increased risk of SHC was living in other family structures than with two parents in girls.

Paper IV: How discrimination and participation are associated with psychosomatic problems among boys and girls in northern Sweden

The fourth paper showed that about seven out of ten boys and almost eight of ten girls reported occurrence of discrimination at the school (p = 0.001). Two thirds of the boys and three quarters of the girls reported low participation (p = <0.001). Independently of each other, low participation and discrimination were associated

with increased risk of PSP (Figure 3). Discrimination was a mediating factor between participation and PSP among both boys and girls. The z-score for the analyses was > ± 2 SD, –2.59 for the boys and –39.27 for the girls. Other significant findings were increased risk of PSP among boys and girls who have less money than their friends. Increased risk of PSP was shown in boys of mixed background (Table 5). No association was shown between foreign extraction and experience of discrimination.

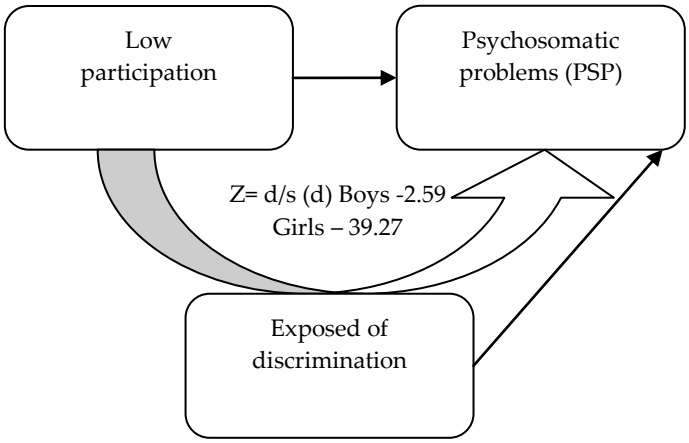


Figure 3. Associations between low participation and PSP with discrimination included as a mediating factor (IV)

DISCUSSION

Subjective health among Swedish boys and girls focussing on parental foreign background (I)

Paper I showed that girls with a foreign background in a Swedish context had increased risk of SHC, and this increased risk could not be explained by disparities in socio-demographic circumstances. While previous research has shown an increased risk of ill health among both boys and girls of foreign extraction (Engström et al. 2004; Reinhardt and Madsen 2002; Weathers et al. 2008; Vieno et al. 2009; Vinnerljung et al. 2007), this paper showed an increased risk of ill health in girls only. Part of the difference in the findings between boys and girls of foreign extraction can be explained by the categorical intersectional model suggested by McCall (2005). Girls of foreign background might also have a higher pressure to maintain the social constructions of culture of their parents' country of origin than the boys of foreign background have (Westin 2003). For example, girls with parents of Turkish or Kurdish origin are expected to marry in their late teens, while the girls themselves instead want to live independent lives, continue to study, have their own economy and create friendships with other young women and men (Westin 2003). Increased risk of ill health among children growing up in single-parent families was the truth for girls only in the present paper. Previous research has also shown an increased risk of ill health in children of single parents (Jablonska et al. 2009; Reinhardt and Madsen 2002; Östberg et al. 2006), but these studies did not perform separate analyses for boys and girls. Why girls in single-adult households showed increased risk of SHC could probably be explained by society's different gender expectations of boys and girls (Connell 1987). For example, girls are expected to take responsibility for younger siblings and share the household duties with the parent (most often a mother) to a higher degree than boys. The huge differences in FAS between the subgroups of pupils of Swedish, mixed, and foreign background did not show any association with SHC, a finding that was unexpected. The proportion of low FAS among children of foreign extraction was similar as the proportion of child poverty reported by Salonen (2012). One explanation for the non-significance between SHC and low FAS could be that Swedish society has a relatively equal material distribution (low Gini Index) (Elgar et al. 2009; Levin et al. 2011). The findings that girls report higher levels of SHC are in line with previous research (e.g. Currie et al. 2008a; Gillander Gådin and Hammarström 2005; Hagquist 2010; West and Sweeting 2003).

Health risk behaviours and their cluster allocations (II)

That low FAS might signal chronically poverty (according to the definition by Lindquist and Sjögren Lindquist 2010) in a society with relatively equal material distribution could be strengthened by the results in paper II, at least in girls. Although there is complete agreement in the literature that girls to a higher degree than boys follow the recommended tooth brushing frequency (e.g. Honkala and Honkala 2011; Julihn et al. 2010) and compliance with healthy behaviours is connected to femininity, associations between low FAS, multiple HRB and inadequate tooth brushing frequency were found in girls. As has been demonstrated in cancer research (Wardle et al. 2003), adolescents in deprived areas are more engaged in cancer-risk behaviours such as smoking, high-fat diet and physical inactivity, which leads to increased risk of cancer mortality in adult life. According to Wardle et al. (2003), smoking is the most predictable HRB of engagement in other HRB. It can be counted as a truth also for the present study, as 97.5% of those who were allocated to the cluster profile of multiple HRB were smokers. Smoking is associated with inadequate tooth brushing and the parent's length of education (Honkala and Honkala 2011). Chronic child poverty was connected to parental unemployment, low parental education and foreign-born parents (Lindquist and Sjögren Lindquist 2010). Increased risk of allocation to the cluster profile of multiple HRB was shown in girls of foreign background compared to girls with a Swedish background. Apart from the low material welfare in the family, these results could illuminate the specific threats that girls in general and especially girls of foreign background are exposed to. Differences in the way boys and girls are expected to follow the culture of their parents' county of origin might lead to increased stress among the girls. For example, girls should marry in their late teens while boys can wait to marry until they are around thirty years old or more (Westin 2003). The associations between boys and girls of mixed background and increased risk of allocation to the cluster profile of multiple HRB could be explained by concepts of fragility due to belonging to a family with parents of two different sets of social constructions of culture (Burr 1995). There might be a lack of support in their formation of a dual belonging (Evergeti and Zonitini 2006), which could press the adolescents to engage in risky behaviours to achieve confirmation (Fryer et al. 2008). However, it seems relevant to claim that allocation to the cluster profile of multiple HRB is related to a family's low social position in society (Marmot 2006). Boys were overrepresented in the cluster profile of drunkenness, but the proportion of boys with a foreign background in that cluster was low. Drinking alcohol is a typical male form of doing gender according to Western social constructions of culture. The adolescents who were allocated to the cluster profile of drunkenness did not have low FAS. Van Tubergen and Poortman (2010) show negative associations between alcohol consumption and a

high amount of pocket money from parents. It is therefore possible to assume that episodes of drunkenness reflect a HRB claiming a position in the hierarchical structure among adolescents (Jessor 1991) while multiple HRB can be seen as a sign of chronic child poverty (Lindquist and Sjögren Lindquist 2010) and other socioeconomic disadvantages, such as residential (neighbourhood) segregation (Biterman and Franzén 2007). However, social constructions of culture can influence adolescents' health behaviour in both positive and negative directions (Despues and Friedman 2007). For example, pupils in Sweden with parents of Turkish or Middle Eastern origin (Holmberg and Hellberg 2008) or from a Muslim background in the Netherlands, especially girls (van Tubergen and Poortman 2010), consume less alcohol than pupils of the majority population.

The cluster analysis also showed associations between inadequate tooth brushing and foreign background, in both boys and girls. Associations have been found between tooth brushing frequency and poor oral health (Perera and Ekanayake 2011). Swedish investigations of children's oral health show a higher frequency of caries among children of foreign background compared to children of Swedish-born parents (Julihn et al. 2010). An assumption is that children in Sweden who have foreign background have equal increased health risks, as shown in the Swiss literature review, i.e. obesity, psychosocial ill health, dental caries and other infectious diseases (Jaeger et al. 2012). The increased risk of dental caries in children of foreign background indicates a predisposed increased risk of arteriosclerosis (Zoellner 2011) and CVD (Cotti et al. 2011) in adulthood. However, some of the differences in dental health between children of Swedish-born parents and children of foreign background can be explained by the successful national dental health prevention programme established in Sweden during the 1970s (Hjern and Grindefjord 2000).

Bullying involvement once or more was associated with increased risk of SHC (III)

The findings in paper III showed associations between any form of bullying involvement and increased risk of SHC, regardless of parental background, family affluence, family structure and gender. Bullying involvement in itself is a harmful expression of asymmetric power relations for all involved. A suggestion that cannot be confirmed by the present study's result is that mental health and aggressive behaviour such as bullying others are associated with low material welfare in the family (Currie 2009).

Boys of foreign background were more likely than those of Swedish or mixed background to have been involved as bullies and that could not be explained by

the huge differences in FAS. A Swedish systematic review of school, learning and mental health suggests that the boys' claim of power over others is a coping strategy against mental ill health (Gustafsson et al. 2010). Suggested associations between mental ill health and claiming of power over others might be partly supported by the present study's result. Bullying involvement probably functions as both a sign and a reason for ill health, as bullying involvement was the only factor that was associated with increased risk of SHC in all three subgroups of boys, and particularly in boys of foreign background. Bulling others seems not be a functional strategy against ill health, and bullying others definitively has a negative health effect on the victims. From a public health perspective, bullying involvement is a waste of human and economic resources (Srabstein and Piazza 2008). However, as in previous studies, this paper showed that girls were less involved in bullying than boys (Gobina et al. 2008; Schnohr and Niclasen 2006; Vaillancourt et al. 2008; Vervoort et al. 2010). The only remaining significant association between socio-demographics and SHC was living in other family structures than with two parents in girls, which also was found in paper I. For girls, living with two parents/adults seems to be a protective health factor, regardless of whether family structure/family constellation is counted as a socioeconomic factor (I) or a relational factor (III). Underlying factors for bullying involvement also need to be sought outside the school, e.g. asymmetric power relations in the family, such as experience of violence (Bauer et al. 2006; Hilton et al. 2010; Unnever 2005). A global study of migrant women's health showed that woman who had migrated were at higher risk of domestic violence if they originated from a country with social constructions of culture where male violence against women is tolerated (Llácer et al. 2007). That might lead to an increased risk of exposure of violence among children of foreign background.

Discrimination and participation were associated with PSP, and discrimination was a mediating factor (IV)

In paper IV discrimination was found to function as a mediating factor between low participation and increased ill health. The finding that discrimination functioned as a mediating factor between low participation and increased ill health is supported by previous research (Voelkl 1995). Pridemore (2000) stresses that a sufficiently warm and participant friendly school environment is one of the most important factors in the children's everyday life for promoting pupils' health. As in a Swedish study (Witkowska and Menckel 2005), paper IV showed that discrimination is a common problem in schools and that girls are more exposed than boys to expressions of asymmetric power relations. It seems as if the negative health impact of the mediating factor is more pronounced in girls than in boys, as there was a huge difference in Z =d/s (d) between boys and girls. A possible

explanation for that difference might be that girls are more aware of discrimination. For example, girls are more exposed than boys to verbal abuse and other forms of discrimination, often with a sexual character, such as being called "whore" (Eliasson et al. 2005). The higher frequencies of low participation and more PSP in girls are probably partly rooted in constructions of femininities and masculinities. Connell (2009) claims that the construction of gender leads to differing expectations of boys and girls; how a proper woman or man is supposed to behave according to normative rules. For instance, a woman is expected to be fragile and reticent (Connell 2009), whereas boys are expected to express their status and power (MacLean et al. 2010), which quite often occurs as discriminating behaviour towards their classmates of both sexes (Eliasson et al. 2005; Srabstein and Piazza 2008; SNAE 2009). The study by Pridemore (2000) shows that participation is significant for pupils' health outcome, and health promotion needs to have a whole-school approach. The concept of whole-school approach includes all actors at school such as pupils and all professions, the environments at school, for example, the playground, the canteen as well as the classroom (Wyn et al. 2000).

Methodological considerations

First of all, the second data set from Östersund used in paper IV was about 13% in size of the WHO-HBSC data set used in papers I–III. The proportion of children of foreign extraction in paper IV was not representative, as fewer boys and girls were of foreign extraction as compared to the country average. That must be taken into consideration when makes comparisons with results in papers I–III. In contrast to papers I and III, paper IV showed increased risk of ill health in boys of mixed background. Girls of foreign background showed increased risk of ill health in paper I, but not in paper III where the bullying variables were included. Several factors may influence those results: (1) SHC and PSP do not include exactly the same psychosomatic symptoms; however, both SHC and PSP have been validated with Rasch analyses that show high reliability and adequate fit regarding differential item function (DIF) (Hagquist 2008; Ravens-Sieberer et al. 2008). (2) Östersund is a small municipality with no segregated neighbourhoods as in Stockholm, Göteborg and Malmö, and families of foreign background might have a socioeconomic status on a par with the majority populations in smaller municipalities, which probably could benefit girls of foreign background. (3) Östersund has more children of mixed background with one parent from Norway than the country average. The most common mixed background in Sweden is to have one Swedish-born and one Finnish-born parent. The result in paper IV with an increased risk of SPS in boys of mixed background was unexpected. However, several of the crude analyses in papers I–III also shown increased risk of ill health

in boys of mixed background, and they were overrepresented in the cluster of multiple HRB.

Some advantages of the use of the Swedish part of the WHO-HBSC survey are that the survey is well established, and the response rate is high. It is a huge database and high quality is guaranteed as SCB is responsible for the basic registration and its statistical procedure. The WHO-HBSC survey's scientific reports and articles were valuable for the literature review process with its huge source of review articles, instrument validations and cross-country comparisons. A limitation was that the design of selected questions sometimes hampered the flexibility, such as that the first year of measurement was from 1997/98 and the question regarding parental labour market participation was changed in 2001/02. Also changed was the question about parental occupational status, which is used for socioeconomic categorization according to work profession, known in Sweden as the SEI code. Those SES indicators would have been included if possible and could have explored a part of the boys' and girls' increased risk of ill health. An aggregation of three measurement years was necessary and made it possible to make multiple regression analyses with subgroups of boys and girls according to the country of birth of their parents. Also, cluster analyses also require large data sets.

The method used can be supported by the suggestions of Marmot (2009), who claims that the focus should be on the causes of ill health among children and adolescents. Ravens-Sieberer et al. (2009) showed that adolescents aged 13 and 15, girls and those of low FAS are at increased risk of multiple SHC, and that is true for adolescents in 95% of the 41 included countries (Ravens-Sieberer et al. 2009). From that study Marmot (2009) concluded that the health status of young people reported in the WHO-HBSC survey is a prediction of upcoming health problems among the adolescents (Marmot 2009). However, this is the same pattern as shown in this thesis, i.e. decreased health with increasing age, higher levels of SHC in girls than in boys and associations with low FAS, despite the fact that this thesis also included the impact of parental background with a categorical intersectional approach according to McCall (2005). Sen and Östlin (2010) describe how lack of an intersectional perspective in health research has significant human costs and how inequalities in health cannot solely be explained by socioeconomic position. They claim that analyses of economic class without being combined with gender analyses increase the risks of the results being misinterpreted and hiding social inequalities between men and women. The results of this thesis would not have been obtained if an ordinary epidemiological approach had been used, where adjustment would have been made for gender and parental background. The clarity of the intersectional model suggested by McCall (2005) contributed to this

thesis with increased understanding and awareness of the inequalities in health that boys and girls of foreign extraction are exposed to. Similarities to the increased risk of ill health among boys and girls of foreign extraction that were found in the present study have been demonstrated in previous Swedish research among adults of foreign background. Those studies included, among other factors, the impact of discrimination (Mulinari 2004; Wamala et al. 2007). The intersectional model was useful in the interpretation process when considering previous Swedish research regarding, for example, social exclusion (Bask 2005), residential segregation (Biterman and Franzén 2007), unemployment and labour market (Bäckman and Franzén 2009), social consequences of ill health (Sternbeck and Hjern 2007) and poverty (Gustafsson et al. 2007).

Outcome variables

Self-rated health (I, III & IV)

Analyses at the individual level in surveys with a two-step cluster design can lead to a biased estimation of the variables. Investigations of sample errors in the WHO-HBSC material for 2001/02 shows that the design effects were negligible for individual factors of SRH, such as SHC (Currie et al. 2004; Danielson 2006). The eight-item SCL (I, III) and the PSP scale (IV) show adequate validity and reliability and are analysed as a single construct, as recommended (Hagquist 2008; Ravens-Sieberer et al. 2008). Haugland et al. (2001) argued that differences related to cultural influence must be taken into consideration when analysing the SCL. Cultural differences in expressions of symptoms, willingness to report illness, social roles and language influence how psychosomatic symptoms are reported (Haugland et al. 2001). The cut-off point for SRH was set as the quartile with worse SRH when estimating risk of ill health (I, III & IV). One problem with a dichotomized index is that the data lose information. However, in epidemiological research dichotomization is useful, because when a point of discrepancy is reached in the normal variation of a variable, the break point can be seen as a line between healthy and unhealthy. Statistical dichotomization has advantages as it eliminates the effects of skewed distribution and homoscedasticity in the normal variation of the variable (Pallant 2007). Luckily, most children in Sweden are healthy and thereby skewed distribution is common in the normal variation of the variables that makes dichotomizing necessary. There is debate in the literature regarding whether SRH is a valid measure of health and what it really predicts. Those who look upon SRH as valid for measuring health claim that SRH is a relatively stable construct for measuring health among adolescents and that SRH predicts lack of general well-being, health care attendance, disability and lifestyle factors regarding health (Breidablik et al. 2008). Critics view SHR as a measure of the individual's perception of health rather than a measure of true health, which they claim is

impossible to predict (Huisman and Deeg 2010). However, longitudinal studies and register studies have strengths that classroom surveys lack, such as verification of diseases, estimation of time trends and real income. On the other hand, classroom surveys have an atmosphere of confidence that might give more honest answers, close to the reality, and they have higher response rates than longitudinal studies and register studies. Classroom surveys are rather simple to monitor and are cheap to carry out. Classroom surveys of SRH thereby contribute to public health sciences, as health promotion in action often consists of dealing with social processes among populations rather than with verified diagnoses that requires secondary and tertiary prevention.

HRB (II)

One of the weaknesses of cluster analyses is the risk of missing values as the analyses need completely filled questionnaires. However, paper II had 11,082 respondents in the final analysis, and the total number of respondents missed due to lack of information was low. The 6.3% (n = 750) of respondents that were excluded in the cluster analysis contained of 56% boys, 12.8% were of foreign background and their FAS was similar to that of the pupils who were included in the final analysis. An obstacle to comparisons between the present cluster analyses and those used in other studies was the differences in categorizing boys and girls into subgroups. Some advantages of the cluster analyses used here was the possibilities to make distinctions between both HRB and demographic characteristics, as the cluster analyses categorize individuals instead of behaviour variables, as in factor analysis.

Explanation variables

Foreign extraction (I–IV)

The validity of the variables regarding parental country of birth can be discussed since it is possible that some children do not know where their parents were born. However, the number of children of foreign extraction in papers I–III corresponds to studies that use register records, for example Biterman and Franzén (2007) and Salonen (2012). A more detailed categorization of parental region of birth as in Nordic countries, Europe and outside Europe would been preferable. Unfortunately, the data material was too small for categorization in such subgroups. There is also an inconsistency in the method for recording mixed background (Aspinall 2000b). Sometimes mixed background is reported as a specific category (Jablonska et al. 2009; Weathers et al. 2008; Vinnerljung et al. 2007), and sometimes in the same category as people of the majority population (Reinhardt and Madsen 2002; Östberg et al. 2006), or included in the category of second-generation immigrants (Bask 2005). Based on the findings, this thesis

claims, in line with Aspinall (2000b), that children of mixed parentage should be categorized in their own subgroup, otherwise their specific health circumstances risk being hidden or hide unique circumstances of other subgroups.

FAS (I–III)

FAS does not measure poverty per se, but is used as a deprivation indicator for the OECD and EU countries because deprivation strongly correlates with poverty. Bradshaw and Richardson (2008) and Currie et al. (2008b) claim that not having a car in the family sometimes is not caused by poverty but by choice and access to public transportation (Torsheim et al. 2004). Having a room of one's own could indicate cultural preferences in the family (Boyce et al. 2006), and holidays with the family also seem to be closely connected with social and cultural traditions (Currie et al. 2008b). Holidaying with the family was the item that showed the lowest validity when agreement between child and parent report of FAS was validated; children of low FAS over-reported their family affluence and parents with high affluence were more willing to participate in the validation study than those who were less affluent (Andersen et al. 2008). The authors thus suggest that FAS is more valid as an SES indicator for affluent children (Andersen et al. 2008). That suggestion could not be supported by the present study's findings. This potential misclass and bias could have led to underestimation or overestimation of the FAS effect in the present study. However, this thesis showed that FAS in a Swedish context seems to reflect child poverty in line with what Lindquist and Sjögren Lindquist (2010) define as chronic child poverty, which means that the likelihood of underestimation of FAS must be considered.

Bullying involvement (III)

In contrast to previous research (e.g. Meland et al. 2010; Molcho et al. 2010; Srabstein and Piazza 2008), paper III defined bullying involvement once or more as a determinant risk factor for ill health as suggested by Bauer et al. (2006). That might explain the higher estimated frequency of bullying involvement among Swedish boys and girls than estimated in the cross-country comparison by Molcho et al. (2010). One shortcoming could be that there were no additional questions about the type of bullying in connection with the questions about the frequency of bullying involvement. If more specific questions had been included, signs of power imbalance such as racism and homophobic assault might have been observed (Connell 2009).

SCOS and discrimination (IV)

An advantage of the instruments used was the validation of instruments such as SCOS and PSP and the mediating formula for test of mediating factor. A weakness

of the discrimination instrument is that no validation was found so far and some difficulties arose, e.g. how to handle the "I do not know" answer option. However, the Cronbach's α showed adequate fit and the suggestion by Ahlström (2009) was adopted, i.e. to look upon "I do not know" as a negative answer and that answer option was included in the category of some form of discrimination. However, this combination of instruments resulted in valuable findings which add new knowledge across several disciplines, for example the pedagogical, the sociological and the public health research fields.

Confounding variables

Family structure and household structure were shown as potential confounders in girls (I & III), which indicates that those variables probably should have been considered as explanatory variables. However, in accordance with the aim of the papers, priority was given to parental background, family affluence and separate analyses for boys and girls. Unfortunately, the question regarding place of residence (I) showed lower credibility than expected. A non-negligible share of the children, regardless of population density in the region, has reported that they live in a metropolitan area. As place of residence did not show associations with SHC and the question seemed to have low validity, this issue was included in the descriptive paper I only. However, from measurement year 2009/10 this question has been clarified, Stockholm, Göteborg and Malmö are now the only answer options for metropolitan areas (SNIPH 2011).

Ethical considerations

As SNIPH is not a research institute, they do not apply for ethical approval. Researchers who are interested in making studies of the WHO-HBSC survey apply for permission and access to the database from the principal investigator. To my knowledge most children comply with the teacher's/researcher's request to fill in the questionnaire and the response rate was high, as is usual in classroom surveys. For that reason, an individual child's wishes to withdraw from participation in the survey must be encouraged by the adults, in order to keep the child's participation voluntary. In Germany and France the policy is to not register data about ethnicity because it can be discriminatory; in the USA ethnicity is registered and it is claimed that this increases equity and decreases discrimination (Norredam et al. 2011). In the UK self-definition of ethnicity is used, and Danish researchers who compared objective measures with subjective measures of ethnicity and country of birth concluded that the British model with self-definition can be regarded as the most valid one (Norredam et al. 2011). To illuminate preventable inequalities in health among children of foreign extraction, it is wise to rely on the ethical statements by Aspinall (2000a) and his UK research colleagues.

Implications

This thesis where intersectionality was taken into consideration contributes to the field of public health in the form of new knowledge of existing inequalities in health among boys and girls in Sweden and suggests the following implications:

- School health promotion programmes for subgroups of pupils according to their gender, parental background and socio-demographic circumstances need to be considered, as the patterns for boys' and girls' health risk differed and were associated with family affluence, family structure and parental background. Interventions must see further than the significance of socioeconomic positions such as education, income and occupational status of the parents (Lynch and Kaplan 2000).
- Prevention programmes are required in school health care that focus on signs and consequences of bicultural stress and bicultural belonging. As cluster analysis functions as an indicator of which HRB can be promoted in the same interventions and which HRB can follow in addition when an intervention focuses on a single HRB (French et al. 2008), prevention programmes against smoking and inadequate tooth brushing frequency that take socio-demographic indicators into account are needed.
- With respect to the advantages of traditional health-promoting interventions such as prevention programmes anchored in clusters of HRB, there is also a need for health-promoting activities that include participation and are initiated in collaboration with the adolescents themselves. As suggested by Woodgate and Leach (2010), there is a need for programmes where the adolescents themselves identify the relevant health issues as well as programmes that also include health-promoting activities for the whole family (Woodgate and Leach 2010). Such programmes seem suitable for integration in health promotion interventions with an educational and empowerment approach (Naidoo and Willis 2009).
- As the occurrence of discrimination and insulting treatment is a common problem in Swedish schools, there is a need for school health promotion programmes focusing on democratic processes, communication and cooperation. However, democratic processes facilitate to live a healthier life (Dahlgren and Whitehead 2007).

CONCLUSIONS AND FUTURE RESEARCH

The results of the papers in this thesis suggest that increased risk of ill health among boys and girls in Sweden is associated with foreign background, family affluence and gender. The conclusions from the results are summarized below:

- Girls of foreign background were at increased risk of SHC. Increased risk of SHC was also found in girls of single-parent households, in girls in grades seven and nine as well as in boys in grade nine. One third of the boys and girls with a foreign background had low FAS, compared to less than one out of ten boys and girls with a Swedish background (I).
- Increased risk of allocation to the cluster profile of multiple HRB was found in boys and girls of mixed background, in girls of foreign background and in girls of low FAS. Increased risk of allocation to the cluster profile of inadequate tooth brushing was shown in boys and girls of foreign background and in girls of low FAS (II).
- All boys and girls who had been involved in any form of bullying were at increased risk of SHC, with the highest risk estimated in bully/victims. Boys of foreign background were overrepresented as bullies and girls of foreign background were overrepresented in all three forms of bullying involvement (III).
- Independently of each other, the occurrence of discrimination and low participation were associated with increased risk of PSP. Discrimination was a mediating factor between participation and PSP. Boys of mixed background showed increased risk of PSP. Low family affluence was associated with increased risk of PSP in boys and girls (IV).

It is important to further explore the mechanisms behind why girls with a foreign background and boys with a mixed background are at higher risk of ill health than their counterparts with same parental background; qualitative studies in the form of focus group interviews might be suitable for this. To improve social relations at schools, in families and society, more research is needed on the reasons why some subgroups of boys and girls are overrepresented in bullying involvement; ethnicity studies seem suitable for that purpose. Longitudinal and/or register studies with an intersectional approach would perhaps explore more in detail the long-term impact of the social gradient during childhood. Such studies might benefit the health of children of vulnerable parents e.g. single parents, migrants, low educated, low income earners and long-term unemployed (cf. Dahlgren and Whitehead 2007).

ACKNOWLEDGEMENTS

I do not have words enough to express my gratitude to my supervisors *Katja Gillander Gådin*, *Eija Viitasara* and *Anders Knutsson*. However, I will make an attempt.

Katja, you have always kindly given me of your time, much more than what was scheduled. You read the drafts of my papers again and again, and still you were optimistic and an excellent pedagogue in academic writing. You have been unbeatable as my main supervisor. Don't forget, everything can be explored with some nice arrows.

Eija, I had with honour to draw on your wisdom and calm, your excellent ability to listen and give me time for reflection. You have encouraged me when I have felt low, worthless and crying over this stupid thesis that I thought would never be finished. You have also, step by step, shared your skill in practice teaching with me, as we have given courses together in the lecturing part of my PhD-student position. You will serve as my model for teaching.

Anders, you have taught me many things. You started with a lesson in how to practice night work. One of the scientific skills you transferred to me from your huge source of knowledge is the importance of knowing the material you are working with. You taught me not to give uncritical credence to software for statistical analysis. I will always follow your habit of starting all serious data analyses with advanced traditional manual calculations. You are the professor who does things from the roots and you teach your adepts with alternative pedagogical methods until we have understood.

Dr Erling Englund, thanks for great statistical support in the analysis processes and co-authorship of one of the papers.

I owe a great debt of thanks to Alan Crozier for excellent and patient correction of the language in all the papers and this thesis; as you know, the English language is not one of my strongest sides.

Thanks to Associate Professor Eva Sällström and Professor Joaquim Soares for reading and giving fruitful comments and opinions on the papers and taking part in my milestone seminars. Thanks to Associate Professor Alireza Behtoui, Linköping University, for valuable recommendations regarding intersectionality at the mid-point seminar. Thanks to Associate Professor Siv Fahlgren for valuable consultation on theories of gender and intersectionality. Thanks to Associate

Professor Marianne Svedlund for organizing and coordinating seminars and educational sessions of high quality for us PhD students.

Thanks to all my colleagues in Sundsvall and Östersund. Some of you I mention by name, but all of you have been equally important. Yvonne Åhrberg, thanks for "disturbing" me so that I took breaks for lunch and participated in social activities. You also fulfilled my wish not to retire before I graduate. Ingrid Lund Bouvin, friend of many years and former fellow student, thanks for always letting me lean on your shoulder and rest on your couch. Thanks to Annika Karlström, Ulrika Eriksson and Evelina Landstedt, former PhD students, who during these five years have been a bit in front of me in the process of fulfilling the PhD student programme and finally reaching a doctoral degree. You did great work and showed me step by step how to go ahead in practice. I have gratefully picked the cherries from your papers, thesis and experience. Your advice has improved my thesis and helped me to minimize unwanted surprises. My fellow doctoral students, including Marie Häggström, my Gemini PhD student, side by side we started and finished our PhD projects. Carolina Klockmo, Helene Olsson, Malin Holmström Rising and Maria Warne, thanks for valuable discussions and opinions on the manuscript at the seminars, company at doctoral courses, small talk during lunches and coffee breaks. It has felt encouraging to be in the company of good people like you.

Many thanks to Christina Olsson at the printing office, Tommy Lodén at the department of IT Support and Elisabeth Domeij at the library, this thesis would not have been written without your practical help.

I owe thanks to my dear family. My partner *Magnus*, built of feelings, who with endless patience, humour and bad memory prepared my breakfast every day, encouraged me to keep on when I was in doubt as to whether it was worth it. My children *Erica* and *Jonas*, for never losing your conviction that I would make it and always ensuring me that I made the right choice to enrol in the PhD student programme. "Mum, you will make it for sure." "But mum, it's you, you have to do it otherwise you won't stay well". *Magnus*, *Erica* and *Jonas*, you have generous minds and are my riches.

My siblings Jens, Diana and Synnöve, you have formed my person and it is with you I share my whole life with the greatest pleasure. I would never been the person I am and achieved this goal without you and your various wise reflections and lovely opinions on the real life outside the University. My mother Barbro, who always, without forewarning, take care of my dog, prepare excellent traditional

food, give us a ride or whatever. My father Karl-Åke who is not with us any more, since 2005, growing up with you on the farm in Junsele meant rough lessons in stamina and how to always complete projects. My mother in-law Eva and your husband Lars, thanks for interesting discussions about dental care, tasty wine and delicious food whenever we meet.

To all of you that I cannot mention by name here, my friends, neighbours and relatives (outside the closest family). When I have been too focused on my research to take normal responsibility for ordinary social life, you always met my withdrawal with sympathy. Keep on inviting me, from now I will behave much better. Finally, the sacrifice for the ones that been involved in my daily work and routines, I know, I have not been the easiest one to cooperate with, but isn't that how it's supposed to be if you want a thesis like this to be finished?

"Människor är ädla rena mirakel"

REFERENCES

Ahlström B (2009) Bullying and Social Objectives A Study of Prerequisites for Success in Swedish Schools. Doctoral thesis. Department of Sociology, Umeå University, Umeå

Ahlström B (2010) Student participation and school success: The relationship between participation, grade and bullying among 9th grade students in Sweden. Education Inquiry 1: 97–115

Andersen A, Krølner R, Currie C, Dallago L, Due P, Richter M, Örkényi, A & Holstein BE (2008) High agreement on family affluence between children's and parents' reports: international study of 11-year-old children. Journal of Epidemiology & Community Health 62: 1092–1094

Antonovsky A (1987) Unraveling the Mystery of Health. Jossey-Bass, San Francisco

Aspinall PJ (2000a) The new 2001 census question set on cultural characteristics: Is it useful for the monitoring of the health status of people from ethnic groups in Britain? Ethnicity & Health 5: 33–40

Aspinall PJ (2000b) Children of mixed parentage: Data collection needs. Children and Society 14: 207–216

Augustsson H & Hagquist C (2011) Kartläggning av studier om nordiska ungdomars psykiska hälsa [Mapping of studies on Nordic adolescents' mental health. In Swedish]. Nordic School of Public Health, Göteborg

Bäckman O & Franzén E (2007) Employment and the labour market. International Journal of Social Welfare 16 Suppl 2: 35–66

Baron R & Kenny D (1986) The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology 51: 1173–1182

Bask M (2005) Welfare problems and social exclusion among immigrants in Sweden. European Sociological Review 21: 73–89

Bauer NS, Herrenkohl TI, Lozano P, Rivara FP, Hill KG & Hawkins JD (2006) Childhood bullying involvement and exposure to intimate partner violence. Pediatrics 118: e235–242

Biterman D & Franzén E (2007) Residential segregation. International Journal of Social Welfare 16, Suppl 2: 127–162

Bjarnason T, Bendtsen P, Arnarsson AM, Borup I, Iannotti RJ, Löfstedt P, Haapasalo I & Niclasen B (2012) Life satisfaction among children in different family structures: A comparative study of 36 Western societies. Children & Society 26: 51–62

Bonino S, Cattelino E & Cairano S (2005) Adolescents and Risk: Behaviors, Functions and Protective Factors. Springer, Milan

Bonita R, Beaglehole R & Kjellström T (2006) Basic Epidemiology. WHO, Geneva

Boyce WT, Torsheim T, Currie C & Zambon A (2006) The Family Affluence Scale as a measure of national wealth: validation of an adolescent self-report measure, 78: 473–487

Boyce WT, Den Besten PK, Stamperdahl J, Zhan L, Jiang Y, Adler NE & Featherstone, JD (2010) Social inequalities in childhood dental caries: The convergent roles of stress, bacteria and disadvantage. Social Science & Medicine 71: 1644–1652

Bradshaw J & Richardson D (2008) Does child income poverty measure child well-being internationally? Social Policy & Society 7: 521–536

Breidablik HJ, Meland E & Lydersen S (2008) Self-rated health during adolescence: stability and predictors of change (Young-HUNT study, Norway). European Journal of Public Health 19: 73–78

Burr V (1995) An Introduction to Social Constructionism. Routledge, London

Connell R (1987) Gender and power: society, the person and sexual politics. Stanford University Press, California

Connell R (2009) Gender in World Perspective. Polity, Cambridge

Cotti E, Dessì C, Piras, A & Mercuro G (2011) Can a chronic dental infection be considered a cause of cardiovascular disease? A review of the literature. International Journal of Cardiology 148: 4–10

Currie CE, Elton RA, Todd, J & Platt S (1997) Indicators of socioeconomic status for adolescents: the WHO Health Behaviour in School-aged Children Survey. Health Education Research 12: 385–397

Currie E, Gabhainn SN, Godeau E, Roberts C, Smith R, Currie D, Picket W, Richter M, Morgan A & Barnekow V (2008a) Inequalities in young people's health. HBSC International Report from the 2005/2006 survey. WHO, Copenhagen

Currie CE, Molcho M, William Boyce W, Holstein B, Torsheim T & Richter M (2008b) Researching health inequalities in adolescents: The development of the Health Behaviour in School-Aged Children (HBSC) Family Affluence Scale. Social Science & Medicine 66: 1429–1436

Currie CE, Roberts C, Morgan A, Smith R, Settertobulte W, Samdal O & Barnekow Rasmussen V (2004) Young people's health in context. HBSC study: international report from the 2001/2002 survey. WHO, Copenhagen

Currie C, Zanotti Z, Morgan A, Currie D, de Looze M, Roberts C, Samdal O, Smith RFO & Barnekow V (2012) Social determinants of health and well-being among young people. Health Behaviour in School-aged Children (HBSC) study: International report from the 2009/2010 survey. WHO, Geneva

Currie J (2009) Healthy, wealthy, and wise: Socioeconomic status, poor health in childhood, and human capital development. Journal of Economic Literature 47: 87–122

Dahlgren G & Whitehead M (2007:14) Policies and strategies to promote social equity in health, Background document to WHO – Strategy paper for Europe. Institute for future studies, Stockholm

Danielson M (2003) Svenska skolbarns hälsovanor 2001/02. Grundrapport [Health behaviour in school-aged children. In Swedish] SNIPH, Stockholm

Danielson M (2006) Svenska skolbarns hälsovanor 2005/2006. Grundrapport [Health behaviour in school-aged children. In Swedish] SNIPH, Stockholm

de los Reyes P & Mulinari D (2005) Intersektionalitet [Intersectionality. In Swedish]. Liber, Malmö

Despues D & Friedman HS (2007) Ethnic differences in health behaviors among college students. Journal of Applied Social Psychology 37: 131−142

Doly J & Kao G (2007) Are racial identities of multiracials stable? Changing self-identification among single and multiple race individuals. Social Psychology Quarterly 70: 405−423

Eastmond M & Åkesson L (Eds.) (2007) Globala familjer: Transnationell migration och släktskap [Global families: Transnational migration and relationship. In Swedish]. Gidlunds, Möklinta

Elgar FJ, Craig W, Boyce W, Morgan M & Vella-Zarb R (2009) Income inequality and school bullying: Multilevel study of adolescents in 37 countries. Journal of Adolescent Health 45: 351−359

Eliasson M, Laflamme L & Isaksson K (2005) Verbal abuse, gender and well-being at school. International Journal of Adolescent Medicine and Health 17: 367−378

Engström K, Diderichsen F & Laflamme L (2004) Parental social determinants of risk for intentional injury: A cross-sectional study of Swedish adolescents. American Journal of Public Health 94: 640−645

Evergeti V & Zonitini E (2006) Introduction: Some critical reflections on social capital, migration and transnational families. Ethnic and Racial Studies 29: 1025−1039

French S, Rosenberg M & Knuiman M (2008) The clustering of health risk behaviours in a Western Australian adult population. Health Promotion Journal Australia 19: 203−209

Fryer RG, Kahn L, Levitt SD & Spenkuch JL (2008) The Plight of Mixed Race Adolescents. National Bureau of Economic Research (14192)

Garson DG (2010) Cluster Analysis. North Carolina State University. Available at: http://faculty.chass.ncsu.edu/garson/PA765/cluster.htm (accessed July 2010)

Gillander Gådin K & Hammarström A (2005) A possible contributor to the higher degree of girls reporting psychological symptoms compared with boys in grade nine? European Journal of Public Health 15: 380−385

Gillander Gådin K, Weiner G & Ahlgren C (2011) School health promotion to increase empowerment, gender equality and pupil participation: A focus

group study of a Swedish elementary school initiative. Scandinavian Journal of Educational Research 1−17

Gobina I, Zaborskis A, Pudule I, Kalnins I & Villerusa A (2008) Bullying and subjective health among adolescents at schools in Latvia and Lithuania. International Journal of Public Health 53: 272−276

Gustafson P (2007) Ett transnationellt perspektiv på migration, kapitel i Transnationella rum. [A transnational perspective on migration, chapter in Transnational rooms. In Swedish]. Olsson E, Lundqvist C, Rabo A, Sawyer L, Wahlbeck Ö & Åkesson L(Eds.). Boréa, Umeå

Gustafsson B, Zaidi A & Franzén E (2007) Financial poverty. International Journal of Social Welfare 16 Suppl 2: 67−90

Gustafsson JE, Westling AM, Alin Åkerman B, Eriksson C, Eriksson L, Fischbein S, Grandlund M, Gustafsson P, Ljungdahl S, Ogden T & Persson RS (2010) School, learning and mental health: a systematic review. The Royal Swedish Academy of Sciences, The Health Committee, Stockholm

Hagquist C (2007) Health inequalities among adolescents: The impact of academic orientation and parents' education. European Journal of Public Health 17: 21−26

Hagquist C (2008) Psychometric properties of the PsychoSomatic Problems Scale: A Rasch analysis on adolescent data. Social Indicator Research 86: 511−523

Hagquist C (2010) Discrepant trends in mental health complaints among younger and older adolescents in Sweden: An analysis of WHO data 1985–2005. Journal of Adolescent Health 46: 258−264

Hagquist C & Andrich D (2004) Measuring subjective health among adolescents in Sweden: A Rasch-analysis of the HBSC-Instrument. Social Indicator Research 68: 201−220

Haug E, Torsheim T & Samdal O (2008) Physical environmental characteristics and individual interests as correlates of physical activity in Norwegian secondary schools: The health behaviour in school-aged children study. International Journal of Behavioral Nutrition and Physical Activity 5: 47

Haug E, Rasmussen M, Samdal O, Iannotti R, Kelly C, Borraccino A et al. (2009) Overweight in school-aged children and its relationship with demographic and lifestyle factors: results from the WHO-Collaborative Health Behaviour in School-aged Children (HBSC) Study. International Journal of Public Health 54: 167−179

Haugland S & Wold B (2001) Subjective health complaints in adolescence: Reliability and validity of survey methods. Journal of Adolescence 24: 611−624

Haugland S, Wold B, Stevensson J, Aaroe LE & Woynarowska B (2001) Subjective health complaints in adolescence: A cross-national comparison of prevalence in dimensionality. European Journal of Public Health 11: 4–10

Helweg-Larsen K, Sundaram V, Curtis T & Boving Larsen H (2003) The Danish Youth Survey 2002: Asking young people about sensitive issues. International Journal of Circumpolar Health 63 Suppl 2:147–152

Hermerén GR (2011) Good research practice. The Swedish Research Council's expert group on ethics, Stockholm

Hernandez DJ, Macartney S & Blanchard VL (2010) Children of immigrants: Family and socioeconomic indicators for affluent countries. Child Indicator Research 3: 413–437

Hilton MJ, Anngela-Cole L & Wakita J (2010) A cross-cultural comparison of factors associated with school bullying in Japan and the United States. The Family Journal 4: 413–422

Hjern A & Grindefjord M (2000) Dental health and access to dental care for ethnic minorities in Sweden. Ethnicity & Health 5: 23–32

Holmberg LI & Hellberg D (2008) Characteristics of relevance for health in Turkish and Middle Eastern adolescent immigrants compared to Finnish immigrants and ethnic Swedish teenagers. The Turkish Journal of Pediatrics 50: 418–425

Honkala S & Honkala E (2011) Tooth brushing and smoking among adolescents: Aggregation of health damaging behaviors. Journal of Clinical Periodontology 38: 442–448

Honkala S, Honkala E & Al-Sahli N (2007) Do life- or school-satisfaction and self-esteem indicators explain the oral hygiene habits of schoolchildren? Community Dental Oral Epidemiology 35: 337–347

Hosmer D & Lemeshow S (2000) Applied Logistic Regression. Wiley, New York

Huang JS, Norman GJ, Zabinski MF, Calfas K & Patrick K (2007) Body image and self-esteem among adolescents undergoing an intervention targeting dietary and physical activity behaviors. Journal of Adolescent Health 40: 245–251

Huisman M & Deeg D (2010) A commentary on Marija Jylhä's "What is self-rated health and why does it predict mortality? Towards a unified conceptual model" (69:3, 2009, 307–316). Social Science & Medicine 70: 652–654

Jablonska B, Lindberg L, Lindblad F & Hjern A (2009) Ethnicity, socio-economic status and self-harm in Swedish youth: A national cohort study. Psychological Medicine 39: 87–94

Jaeger N, Hossain M, Kiss L & Zimmerman D (2012) The health of migrant children in Switzerland. International Journal of Public Health 57: 659–671

Jessor R (1991) Risk behavior in adolescence: A psychosocial framework for understanding and action. Journal of Adolescent Health 12: 597–605

Juang L & Moin Syed M (2010) Family cultural socialization practices and ethnic identity in college-going emerging adults. Journal of Adolescence 33: 347–354

Julihn A, Ekbom A & Modéer T (2010) Migration background: A risk factor for caries development during adolescence. European Journal of Oral Sciences 118: 618−625

Kahlin Reichard Y, Werner S, Romild U & Alricsson M (2009) Self-related health, physical activity, BMI and musculoskeletal complaints: A comparison between foreign and Swedish high school students. International Journal of Adolescent Medicine and Health 21: 327−341

Karvonen S, Vikat A & Rimpälä M (2005) The role of school context in the increase in young people's health complaints in Finland. Journal of Adolescence 28: 1−16

Körner S & Wahlgren L (2006) Statistisk dataanalys. [Statistical data analysis. In Swedish]. Studentlitteratur, Lund

Lambert P, Scourfield J, Smalley N & Jones R (2008) The social context of school bullying: evidence from a survey of children in South Wales. Research Papers in Education 23: 269−291

Last JM (Eds.) (2007) A Dictionary of Public Health. Oxford University, New York

Levin KA, Torsheim T, Vollebergh W, Richter M, Davies CA, Schnohr CW, Due P & Currie C (2011) National income and income inequality, family affluence and life satisfaction among 13 year old boys and girls: A multilevel study in 35 countries. Social Indicator Research 104: 179−194

Lindquist M & Sjögren Lindquist G (2010) The dynamics of child poverty in Sweden. Journal of Population Economics 25: 1423−1450

Llácer A, Zunzunegui MV, del Amo J, Lucía Mazarrasa L & Bolumar F (2007) The contribution of a gender perspective to the understanding of migrants' health. Journal of Epidemiology & Community Health 61, Suppl 2: ii4−ii10

Lykke N (2005) Nya perspektiv på intersektionalitet: Problem och möjligheter [New perspectives on intersectionality: Problems and possibilities. In Swedish] Kvinnovetenskaplig tidskrift 2−3: 8−17

Lynch J & Kaplan G (2000) Socioeconomic Position, chapter in Social Epidemiology. Berkamn LF & Kawachi I (Eds.). Oxford, New York

Mackey E & La Greca A (2007) Adolescents' eating, exercise, and weight control behaviors: Does peer crowd affiliation play a role? Journal of Pediatric Psychology 32: 13−23

MacLean A, Sweeting H & Hubt K (2010) 'Rules' for boys, 'guidelines' for girls: Gender differences in symptom reporting during childhood and adolescence. Social Science & Medicine 70: 597−604

Marmot M (2006) Status Syndrome. Bloomsbury Publishing, London

Marmot M (2009) Social determinants and adolescent health. International Journal of Public Health 54: 125−127

McCall L (2005) The complexity of intersectionality. Journal of Woman in Culture and Society 30: 1772−1800

Meland E, Ryding JH, Lobben S, Breidablik HJ & Ekeland TJ (2010) Emotional, self-conceptual, and relational characteristics of bullies and the bullied. Scandinavian Journal of Public Health 38: 359−367

Molcho M, Cristini F, Gabhainn SN, Santinello M, Moreno C, De Matos MG, Bjarnason T, Baldassari D & Due EP (2010) Health and well-being among child immigrants in Europe. Eurohealth 16: 20−23.

Mulinari, D. (2004). Medicinsk praktik i det postkoloniala Sverige, kapitel i Kropp och genus i medicine [Medical practice in post-colonial Sweden chapter, in Body and Gender in Medicine]. Hovelius B & Johansson E (Eds.). Studentlitteratur, Lund

Naidoo J & Willis J (2009) Foundations for Health Promotion. Elsevier, London.

NE (2008) Available at: www.ne.se (accessed April 2008)

Norredam M, Kastrup M & Helweg-Larsen K (2011) Register-based studies on migration, ethnicity, and health. Scandinavian Journal of Public Health 39 Suppl 7: 201−205

Norušis MJ (2010) PASW Statistics 18 Statistical Procedures Companion. Pearson, San Francisco

Östberg V, Alfven G & Hjern A (2006) Living conditions and psychosomatic complaints in Swedish schoolchildren. Acta Paediatrica 95: 929−93

Pallant J (2007) SPSS Survival Manual. McGraw-Hill, Berkshire

Parker L & Roberts L (2005) Critical Theories of Race, chapter in Research Methods in the Social Sciences. Somekh B & Lewin C (Eds.) Sage, London

Pascoe EA & Smart Richman L (2009) Perceived discrimination and health: A meta-analytic review. Psychological Bulletin 135: 531−554

Peralta, A (2005) Det sagda och det tänkta [The said and the thought. In Swedish]. In SOU 2005:4. Fritzes, Stockholm

Perera I & Ekanayake L (2010) Influence of oral health-related behaviours in oral health among adolescents. Community Dental Oral Epidemiology 39: 345−351

Pridemore P (2000) Children's participation in development for school health. Compare 30: 103−113

Ravens-Sieberer U, Erhart M, Torsheim T, Hetland J, Freeman J, Danielson M & Thomas C (2008) An international scoring system for self-reported health complaints in adolescents. European Journal of Public Health 18: 294 −299

Ravens-Sieberer U, Torsheim T, Torsheim T, Hetland J, Vollenberg W, Cavallo F, Jericek H, Alikasifoglu M, Välimaa R & Ottova V (2009) Subjective health, symptom load and quality of life of children and adolescents in Europe. International Journal of Public Health 54 Suppl 2: 151−159

Reinhardt PC & Madsen M (2002) Parents' labour market participation as a predictor of children's health and wellbeing: a comparative study in five Nordic countries. Journal of Epidemiology & Community Health 56: 861–867

Richter M, Leppin A & Gabhainn SN (2006) The relationship between parental socio-economic status and episodes of drunkenness among adolescents: findings from a cross-national survey. BMC Public Health 6: 289

Richter M, Vereecken C, Boyce W, Maes L, Gabhainn SN & Currie C (2009) Parental occupation, family affluence and adolescent health behaviour in 28 countries. International Journal of Public Health 54 Suppl 2: 203–212

SALAR (2012) Available at: www.kolada.se (accessed June 2012)

Salonen T (2012) Barnfattigdomen i Sverige. Årsrapport 2012 [Child poverty in Sweden. Annual report. In Swedish]. Save the Children, Sundbyberg

SCB (2012) Available at: www.scb.se (accessed June 2012)

Schnohr C & Niclasen BVL (2006) Bullying among Greenlandic schoolchildren: Development since 1994 and relations to health and health behaviour. International Journal of Circumpolar Health 65: 305–312

Sellström E, Arnoldsson G, Bremberg S & Hjern A (2008). The neighborhood they live in: Does it matter to women's smoking habits during pregnancy. Health and Place 14: 155–166

Sen G & Östlin P (2010) Gender Equity in Health: The Shifting of Evidence and Action. Taylor & Francis, New York

SFS 2008:567 Diskrimineringslagen [The Discrimination Act. In Swedish]. The Swedish Statute Book, Stockholm

SFS 2010:800 Skollagen [The Education Act. In Swedish]. The Swedish Statute Book, Stockholm

SNAE (2009) Diskriminerad, trakasserad, kränkt? Barns, elevers och studerandes uppfattningar om diskriminering och trakasserier [Discriminated, harassed, degrading treated ? Childs, pupil's and students perceptions of discrimination and harassment. In Swedish]. Fritzes, Stockholm

SNIPH (2011) Svenska skolbarns hälsovanor 2009/10. Grundrapport [Health behaviour in school-aged children. In Swedish] SNIPH, Östersund

Srabstein J & Piazza T (2008) Public health, safety and educational risks associated with bullying behaviors in American adolescents. International Journal of Adolescents Medicine and Health 20: 223–233

Stenbeck M & Hjern A (2007) Social consequences of illness. International Journal of Social Welfare 16 Suppl 2: 105–126

Stiles B, Liu X & Kaplan H (2000) Relative deprivation and deviant adaptations: The mediating effects of negative self-feelings. Journal of Research in Crime and Delinquency 37:64–90

Torsheim T, Currie C, Boyce W, Kalnins I, Overpeck M & Haugland S (2004) Material deprivation and self-rated health: A multilevel study of adolescents from 22 European and North American countries. Social Science & Medicine 59: 1–12

Unnever J (2005) Bullies, aggressive victims, and victims: Are they distinct groups? Aggressive Behaviour 31: 153–171

Vaillancourt T, McDougall P, Hymel S, Krygsman A, Miller J, Stiver K & Davis C (2008) Bullying: Are researchers and children/youth talking about the same thing? International Journal of Behavioral Development 32: 486–495

van Tubergen F & Poortman AR (2010) Adolescent alcohol use in the Netherlands: The role of ethnicity, ethnic intermarriage, and ethnic school composition. Ethnicity & Health 15: 1–13

Vereecken C, Inchley J, Subramanian SV & Hublet A (2005) Health inequalities: The relative influence of individual and contextual socio-economic status on consumption of fruit and soft drinks among adolescents in Europe. European Journal of Public Health 15: 224–232

Vervoort MHM, Scholte RHJ & Overbeek G (2010) Bullying and victimization among adolescents: The role of ethnicity and ethnic composition of school class. Journal of Youth & Adolescence 39: 1–11

Verzeletti C, Maes L, Santinello M & Vereecken C (2010) Soft drink consumption in adolescence: Associations with food-related lifestyles and family rules in Belgium Flanders and the Veneto Region of Italy. European Journal of Public Health 20: 312–317

Vieno A, Santinello M, Lenzi M, Baldassari D & Mirandola M (2009) Health status in immigrants and native early adolescents in Italy. Journal of Community Health 34: 181–187

Vinnerljung B, Hjern A, Weitoft GR, Franzén E & Estrada F (2007) Children and young people at risk. International Journal of Social Welfare 16 Suppl 2: 163–202

Voelkl K (1995) School warmth, student participation, and achievement. Journal of Experimental Education 63: 127–139

Wamala S, Boström G & Nyqvist K (2007) Perceived discrimination and psychological distress in Sweden. British Journal of Psychiatry 190: 75–76

Wamala S, Merlo J & Boström G (2006) Inequality in access to dental care services explains current socioeconomic disparities in oral health: The Swedish National Surveys of Public Health 2004–2005. Journal of Epidemiology & Community Health 60: 1027–1033

Wardle J, Jarvis MJ, Steggles N, Sutton S, Williamson S, Farrimond H, Cartwright M & Simon AE (2003) Socioeconomic disparities in cancer-risk behaviours in

adolescence: Baseline results from the Health Behaviour in Teenagers Study (HABITS). Preventive Medicine 36: 721–730

Wardle J, Robb K & Johnson F (2002) Assessing socioeconomic status in adolescents: the validity of a home affluence scale. Journal of Epidemiology & Community Health 56: 595–599

Weathers AC, Novak SP, Sastry N & Norton EC (2008) Parental Nativity Affects Children's Health and Access to Care. Journal of Immigrant Minority Health 10: 155–165

Weden MM & Zabin LS (2005) Gender and ethnic differences in the co-occurrence of adolescent risk behaviors. Ethnicity & Health 10: 213–233

West P & Sweeting H (2003) Fifteen, female and stressed: Changing patterns of psychological distress over time. Journal of Child Psychology and Psychiatry 44: 399–411

West P & Sweeting H (2004) Evidence on equalization in health in youth from the West of Scotland. Social Science & Medicine 59: 13–27

Westin C (2003) Young people of migrant origin in Sweden. International Migration Review 37: 987–1010

WHO (2012) Available at: https://apps.who.int/aboutwho/en/definition.html (accessed July 2012)

Williams DR, Neighbors HW & Jackson JS (2003) Originally published as: Racial/Ethnic Discrimination and Health: Findings From Community Studies. American Journal of Public Health 93: 200–208

Witkowska E & Menckel E (2005) Sexual health perceptions of sexual harassment in Swedish high schools: Experiences and school environment problems. European Journal of Public Health 15: 78–85

Woodgate R & Leach J (2010) Youth's perspectives on the determinants of health. Qualitative Health Research 20: 1173–1182

Wyn J, Chaill H, Holdsworth R, Rowling L & Carson S (2000) Mind Matters, a whole-school approach promoting mental health and wellbeing. Australian and New Zealand Journal of Psychiatry 34: 594–601

Yuval-Davis N (1997) Gender and Nation. Sage, London

Zoellner H (2011) Dental infection and vascular disease. Seminars in thrombosis and hemostasis 37: 181–192