

Health Equity Series No 16  
Ylva Almquist





# A class of origin

The school class as a social context and health disparities  
in a life-course perspective

Ylva Almquist

©Ylva Almquist, Stockholm 2011  
Cover picture: Ylva Almquist

ISBN 978-91-7447-246-2  
ISSN 1651-5390

Printed in Sweden by PrintCenter US-AB, Stockholm 2011  
Distributor: Department of Sociology

*“My mother is a poem  
I’ll never be able to write  
though everything I write  
is a poem to my mother”*

S. Doubiago



# Abstract

The aim of the present thesis is to examine various aspects of the school-class structure and their links to health in a life-course perspective. The empirical studies are based on two longitudinal data materials of cohorts born in the 1950s, followed up until middle age.

In the first study, the overall status distribution in the school class was shown to be associated with both minor psychiatric disorder in childhood and self-rated health in adulthood. Thus, ill-health was more common among individuals who attended school classes less equal in terms of status.

The second study demonstrated that it was more common among those who had fewer mutual friendships in the school class to report poorer health as adults. Socioeconomic career emerged as the primary explanation for men while, for women, these findings were largely unaccounted for by any of the included child and adult circumstances.

Findings from the third study suggested the child's status position in the school class, i.e. peer status, to be related to a wide range of health outcomes in adulthood. In particular, lower peer status was linked to an excess risk of mental and behavioural disorders, cardiovascular diseases and diabetes. Childhood social class did not confound these associations to any large extent.

The fourth study examined two types of social isolation in the school class: marginalisation (low peer status) and friendlessness. Hospitalisation due to any disease was more common among marginalised children compared to among non-isolates, whereas no corresponding association was found for the friendless. For both types of isolates, the number of hospitalisations was greater than among non-isolated individuals. Of the studied childhood factors, scholastic ability emerged as an important mechanism.

In sum, this thesis points to the relevance of the school class for health development across the life course and to the complexity of pathways through which influences of the school class may operate.

# Sammanfattning

Syftet med den här avhandlingen är att undersöka olika aspekter av skolklasstrukturen och hur dessa är kopplade till hälsa i ett livsförlopps-perspektiv. De empiriska studierna bygger på två kohorter födda under 1950-talet och som har följts upp till medelåldern.

Den första studien visade på kontextuella effekter av den övergripande statusfördelningen i skolklassen på psykiska problem i barndomen och självskattad hälsa i vuxenlivet: ohälsa var vanligare bland individer som gick i skolklasser med större ojämlikhet i termer av status.

Resultaten i den andra studien tydde på att det var vanligare bland dem med färre vänner i skolklassen att rapportera ohälsa som vuxna. Socioekonomisk karriär framträdde som en viktig förklaring för män medan ingen av de inkluderade omständigheterna i barndomen och vuxenlivet kunde förklara sambandet för kvinnor.

Den tredje studien fokuserade på statusposition i skolklassen, kamratstatus, i relation till olika hälsoutfall i vuxenlivet. Lägre kamratstatus var kopplat till en högre risk för de flesta sjukdomar, som exempelvis psykiska sjukdomar och beteendestörningar, kardiovaskulära sjukdomar och diabetes. Social klass i barndomen förklarade inte dessa samband.

I den fjärde studien undersöktes två typer av social isolering i skolklassen: marginalisering (låg kamratstatus) och avsaknad av vänskapsrelationer. Bland marginaliserade barn var det vanligare att bli inlagd på sjukhus i vuxen ålder oavsett sjukdom, medan det inte fanns något motsvarande samband för dem utan någon vänskapsrelation. För båda typer av isolerade var antalet sjukhusinläggningar större jämfört med dem som inte var isolerade. Av de barndomsfaktorer som undersöktes framstod skolrelaterad förmåga som en viktig mekanism.

Sammanfattningsvis har den här avhandlingen pekat på vikten av skolklassen för hälsa över tid och på den komplexitet som omgärdar de vägar genom vilka hälsoeffekter av skolklassen kan tänkas verka.



# List of publications

The thesis is based on the following papers:

- Study I      Almquist, Y. The school class as a social network and contextual effects on childhood and adult health: Findings from the Aberdeen Children of the 1950s Cohort study. *Submitted.*
- Study II      Almquist, Y. Childhood friendships and adult health: Findings from the Aberdeen Children of the 1950s Cohort study. *Accepted for publication in European Journal of Public Health.*
- Study III      Almquist, Y. (2009) Peer status in school and adult disease risk: A 30-year follow-up study of disease-specific morbidity in a Stockholm cohort. *Journal of Epidemiology and Community Health*, 63(12):1028-1034.
- Study IV      Almquist, Y. (2010) Social isolation in the classroom and adult health: A longitudinal study of a 1953 cohort. *Advances in Life Course Research*, doi:10.1016/j.alcr.2010.11.001

The published articles are reprinted with the kind permission of the publishers.

# Contents

1. Introduction .....	1
1.1 Social determinants of health .....	1
1.2 The life course .....	2
1.3 Children and childhood .....	3
1.4 School class structures and health .....	4
1.5 Overview of the thesis .....	5
2. Aim .....	6
3. A conceptual framework .....	7
3.1 The school class as a social network .....	7
3.1.1 A theory of social structures .....	8
3.1.2 Applying sociometry to measure networks .....	9
3.1.3 Describing and analysing networks .....	11
3.1.4 Group dynamics .....	12
3.1.5 Dimensions of the school class network .....	14
3.2 Social relations .....	15
3.3 Social positions .....	18
3.4 Social isolation .....	22
3.5 Pathways .....	23
3.5.1 Life-course theory .....	23
3.5.2 School class conditions and health in a life-course perspective .....	24
3.6 Gender differences .....	30
3.7 School class structures and health: previous empirical findings .....	31
3.7.1 Cross-sectional studies .....	32
3.7.2 Longitudinal studies .....	33
3.8 Outline of the present studies .....	35
4. Data materials and measurements .....	38
4.1 Data materials .....	38
4.1.1 The Aberdeen Children of the 1950s Cohort study .....	38
4.1.2 The Stockholm Birth Cohort study .....	39
4.2 Measurements .....	42
5. The main findings .....	46
5.1 Linking the results to the hypothetical model .....	47

6. Theoretical and methodological considerations .....	49
6.1 School class networks .....	49
6.2 Measuring health .....	56
6.3 Capturing pathways .....	59
6.4 'Real' life-course studies .....	62
6.5 Relevance for young people of today.....	63
7. Concluding discussion.....	64
7.1 The need for a social curriculum? .....	64
Acknowledgements .....	67
References .....	70



# 1. Introduction

The present thesis studies the school class as a social context and how aspects of the school class structure may influence health across the life course. The title is intentionally formulated to echo the notion in sociology of the relevance of a 'social class of origin'. Might we similarly speak of a 'school class of origin' that also has important consequences for life chances? A brief background to this hypothesis is presented below.

## 1.1 Social determinants of health

It is well-established that health is to a great extent socially determined (Link & Phelan, 1995; Marmot & Wilkinson, 1999; Raphael, 2004; Vågerö & Lundberg, 1989). The concept of 'social determinants of health' broadly refers to the social factors which presumably shape the health of individuals (Graham, 2004). Some have argued that the lowest common denominator among social determinants of health is 'social structure' (Blane, 1985; Turner, 1987; Williams, 2003). Social structure is indeed a fundamental concept in the social sciences (Cook & Whitmeyer, 1992) but since its specifications vary across theoretical perspectives it is precarious to define (Lawler, Ridgeway, & Markovsky, 1993). Nevertheless, Blau (1977) has made an influential attempt to identify certain elementary properties of social structure: a) there are differences in social positions, b) there are relations among these positions and c) people's positions influence their social relations. Put differently, social structure refers to the macro-level distribution of social positions that reflect and affect social relations between individuals.

The macrostructure of society, interpreted as the distribution of social positions at the societal level, has long been regarded as a major determinant of health (Marmot, 2004; Marmot & Wilkinson, 1999). In this field of research, the notion of social position usually refers to the socioeconomic status which is linked to an individual's occupational class, education and wealth. There is now ample evidence of health differences according to socioeconomic status, suggesting the existence of a social gradient in health (Berkman & Kawachi, 2000; Fox, 1989; Graham, 2000; Marmot & Wilkinson, 1999). Moreover, this association seems to be present whichever health outcome is studied (Elstad, 2000). This has led researchers to claim that individuals who occupy disadvantaged social positions in the

macrostructure of society have a ‘general susceptibility’ to disease (Cassel, 1976; Marmot, Shipley, & Rose, 1984).

Another health determinant that has consistently been put forward involves social relations (Ballantyne, 1999; Brisette, Cohen, & Seeman, 2000; Cacioppo & Hawkey, 2003; Cohen, Gottlieb, & Underwood, 2000). This strand of research has focused on the structure, quality and quantity of social relations as central predictors of health. It has been claimed that individuals who have poor social relations are less healthy and have a higher risk of premature death (House, Landis, & Umberson, 1988). Social relations, since they are anchored in individuals, constitute ‘microstructures’. While it may be argued that microstructures and macrostructures are homologous, an important difference lies in the definitions of ‘position’ and ‘relation’: the concept of microstructures defines social positions as a function of dichotomous relations between individuals whereas macrostructures involve social positions in terms of categories of people based on particular attributes (Blau, 1977). Thus, while social positions and social relations, in terms of determinants of health, are basically two dimensions of social structure, they operate at different levels of analysis. As I will discuss in my conceptual framework, there are ways to transcend this distinction between macro and micro.

## 1.2 The life course

In the light of the large number of studies that confirm the link between social structure and health, it has been argued that research must move towards a deeper knowledge of the complex mechanisms that underpin the social patterning of health (Bartley, Blane, & Montgomery, 1997; Li, Mattes, McMurray, Hertzman, & Stanley, 2009). Although a number of explanations have been put forward (see e.g. Droomers, Schrijvers, van de Mheen, & Mackenbach, 1998; Ross & Wu, 1995), much of the literature still lacks a common explanatory approach and, furthermore, it tends to focus primarily on the adult population (Li, et al., 2009). Consequently, researchers have emphasised the role of socially-patterned exposures throughout life in creating health disparities, stressing the need to adopt a life-course perspective (Bartley, et al., 1997; Davey Smith, 1997; Davey Smith, Gunnell, & Ben-Shlomo, 2001; Hallqvist, Lynch, Bartley, Land, & Blane, 2004; Lawlor, Sterne, Tynelius, Davey Smith, & Rasmussen, 2006; Vågerö & Illsley, 1995).

Due to the formative character of childhood, it could be argued that various conditions linked to social structure in this phase in life may come across as particularly important for health when one applies a life-course perspective. As Graham and Power (2004, p. 673) maintain: “*childhood origins shape adult destinations*”. Life-course research that takes its starting-point in structural conditions in childhood and their relevance for

children's health often focuses on the socioeconomic status of the parents. These studies have found parental occupational class, income and education to be associated with children's concurrent morbidity and mortality from a wide range of causes (Chen, Martin, & Matthews, 2006; Egbuonu & Starfield, 1982; Emerson, Graham, & Hatton, 2006; Östberg, 1996). Furthermore, childhood socioeconomic status has frequently been linked to various health outcomes in adulthood (Blane et al., 1996; Galobardes, Lynch, & Davey Smith, 2008; Lawlor et al., 2005; Lawlor, et al., 2006; Lundberg, 1997).

### 1.3 Children and childhood

Life-course research into childhood socioeconomic status and health has undoubtedly contributed to the understanding of health disparities. Nevertheless, since it primarily involves the social structures that adult society imposes on children's socialisation, it may lack a child-oriented perspective.

Since the 1980s, important theoretical and empirical work has been carried out in the field of childhood sociology, underlining the conceptual autonomy of children and childhood from other categories such as the family (Corsaro, 1997). Focus has gradually shifted from children as bystanders in their own development and childhood as important primarily as a path towards adulthood, to an emphasis on children as social actors who participate in the shaping of their own social reality and childhood as worth studying in its own right (Abel, 1991; see also Brolin Låftman, 2009). Consequently, childhood socialisation is a social and collective process, not just development in a social context (Prout & James, 2005). By entering a social system in which they interact and negotiate with others, children establish understandings of social knowledge that are continuously built on (Corsaro & Rizzo, 1988). Accordingly, the present thesis argues that the specific features of childhood, in terms of the social structures that shape and are shaped through the interaction between children in their everyday lives, should also be taken into consideration in life-course research into social determinants of health.

In childhood, nothing occupies as much of a child's time as attending school and, besides the home, the classroom is the place where he or she spends more waking hours than anywhere else. Thus, the school constitutes one of the most influential social contexts during childhood. In addition to being a work place analogous to the one of adults, the school is a social arena where social interaction between peers occurs on a daily basis. Coming to terms with the peer context is often seen as a major challenge for children during the school years (Hartup, 1984). By the time they reach middle childhood, more than 30 % of children's social interactions involve same-aged or near-aged peers (Gifford-Smith & Brownell, 2003). Recent statistics

from the Swedish organisation “Children’s rights in society” (BRIS) have demonstrated that close to 30 % of their contacts with children through the BRIS helpline, chat, or e-mail involve problems with peers (BRIS, 2010).

At school, children are nested in school classes. As far back as the 1950s, in his seminal essay, Parsons (1959) maintained that the school class is a social system which may be regarded as the focal socialisation agency for children and young people. Since then, scholars have repeatedly described the school class as a social unit of key significance in Western cultures (Cairns & Cairns, 1994; Hartup, 1984; Kindermann, 1993). What goes on in the classroom, affects the development and functioning of all other aspects of children’s lives, such as the family, the school, and the community (Gifford-Smith & Brownell, 2003).

## 1.4 School class structures and health

This thesis seeks to link the sociological notion of social structure and its importance for health disparities to a life-course perspective that takes its starting-point in the specific structures of childhood. The school class constitutes such a structure.

The school class will here be viewed as a social network whose network structure as a whole, both in terms of the overall distribution of social positions and the patterning of social relations, is assumed to have important consequences for health development. In addition to considering positions and relations at the school class level, I will also look at the analogous aspects at individual level and their consequences for health. The concept of ‘peer status’ will be used as an indicator of the child’s social position in the school class, whereas social relations include the child’s friendships with classmates. By regarding the classroom from a network perspective, the gap between different dimensions of social structure can be transcended, which makes it possible to study many structural aspects of the school class within a single theoretical (and empirical) framework.

While the importance of the school class for children’s health is far from being a neglected topic, studies that address the long-term influences of school class structures on health are still rare. This thesis intends to fill some of these knowledge gaps by using two large-scale, longitudinal data materials of cohorts born in Aberdeen and Stockholm in the 1950s. Beside sociometric information that makes it possible to construct measures of structure at both school class and individual level, these data materials contain a wide variety of health outcomes.

The studies upon which the thesis is based also include additional factors such as socioeconomic background, scholastic ability, behavioural problems, health-related behaviours and social support. These will help us to reach a deeper understanding of how and why the school class may influence health across the life course. It can indeed be argued that the very purpose of a life-



course perspective is to integrate different mechanisms as they interact over the life time (cf. Elstad, 2000).

## 1.5 Overview of the thesis

This introductory text contains seven chapters. Following the short introduction in this first chapter, the aim of the thesis is presented in Chapter 2. The third chapter elaborates on a theoretical framework for the study of school class as a social context in relation to health disparities and outlines the four empirical studies upon which the dissertation is based. The fourth chapter describes the data materials and methods used in the empirical studies. Chapter 5 is a discussion of the most important results, while the sixth chapter deals with some theoretical and methodological considerations raised by this thesis. Finally, the seventh chapter is a general discussion which includes policy implications.

## 2. Aim

The overall aim of this thesis is to study various structural aspects of the school class as a social context and how these may be linked to health in a life-course perspective. More specifically, the objectives are:

To study aspects of the overall network structure of the school class and whether they influence concurrent and subsequent health (Study I).

To investigate whether the number of friendships with classmates is linked to health in adulthood (Study II).

To examine whether the association between friendships and subsequent health is confounded by and/or mediated through various circumstances in childhood and adulthood (Study II).

To explore the relationship between peer status in the school class and health in adulthood (Study III).

To examine whether the magnitude of the association between childhood peer status and health varies for a number of disease-specific outcomes (Study III).

To analyse the association between social isolation in the school class and health in adulthood (Study IV).

To explore whether different types of isolation have independent effects on adult health (Study IV).

To study whether the association between social isolation and subsequent health is confounded by (and/or mediated through) various childhood circumstances (Study IV).

## 3. A conceptual framework

At the beginning of this chapter [3.1-3.4] I present a framework for analysing school class structures which takes its starting-point in social network theory. I then consider various mechanisms that may link structural conditions in the school class to health across the life course [3.5]. In the following section, I comment briefly on gender differences concerning the school class and its influences on health development [3.6]. The next section [3.7] presents an overview of previous research relevant to the study of school class influences on health. The results of the overview are subsequently discussed in relation to the design of the four empirical studies included in this thesis [3.8].

### 3.1 The school class as a social network

The division between macro and micro has long been a key issue in sociology and is something that this thesis clearly taps into. In some ways, a social network approach surpasses this distinction by considering multiple levels: networks are nested within networks (Doreian & Stokman, 1997; Lawler, et al., 1993; Wasserman & Galaskiewicz, 1994). From this point of view, no sociological entities are by definition macro or micro; they are, rather, one or the other depending on the topic in focus. As for the school class, a social network perspective enables us to examine a school classes at both the class level ('sociocentric networks') and the individual level ('egocentric networks') within a single framework (see Table 1). Moreover, the introduction introduced two major social determinants of health, social positions and social relations, along with a caveat that highlighted differences with regard to the level of analysis. Applying a network perspective disentangles these problems because positions and relations can be conceptualised at each level of analysis. Hence, social network analysis seems to be a fruitful way of analysing school class structures.

#### *Sociocentric and egocentric networks*

A social network may, on the one hand, be interpreted in terms of a macrostructure. This requires a type of network that includes all individuals within certain boundaries: a 'sociocentric network' (Marsden, 2002). The school class serves as a distinctive example of such a network. Accordingly, at the school class level, the complete aggregation of individuals constitutes

the level of analysis. Additionally, two types of analytical approach at the school class level may be distinguished (see Table 1): relational and positional. While the relational approach addresses the density or transitivity of the class structure (i.e. how interconnected the members of the class are), the positional approach focuses on the status differentiation across the network. Numerous individual microstructures or ‘ego networks’ are nested within the larger school class network. Targeting this type of structure means that the network is viewed from the perspective of each individual (Garton, Haythornwaite, & Wellman, 1997). Here, too, approaches may be divided into relational and positional. A relational approach with the individual as the unit of analysis focuses on the individual’s involvement in relations with others, whereas the positional approach aims at analysing the individual’s position within the network structure.

The rest of this section [3.1.1-3.1.5] will present a general discussion of the school class, with emphasis on the sociocentric network perspective; the subsequent sections will be specifically devoted to the study of school class structures from an egocentric perspective, including both the relational and the positional approach [3.2-3.4].

Table 1. A four-fold typology of school class network structure. Source: Burt (1980), adapted by author.

	<i>Level of aggregation</i>	
	School class ‘Sociocentric’	Individual ‘Egocentric’
<i>Analytical approach</i>		
Relational	Structure as dense and/or transitive	Egocentric network as extensive, dense and/or multiplex
Positional	Structure as a distribution of status	Occupant of a network position as central and/or prestigious

### 3.1.1 A theory of social structures

The concept of social networks has its roots in classical sociology where it was originally used as a metaphor to describe the complex patterns of the social world (for a more detailed description of the development of social network theory, see Freeman, 2004; Scott, 1988). Subsequent research in social psychology and anthropology has also highlighted the importance of

the structural properties of social relations as a key element in the study of social networks (Scott, 1988).

In the 1930s, the metaphor of social networks was developed into a sociological concept when the foundations of ‘sociometry’ were laid (see Moreno, 1934). Sociometry has been described as: “*a method for discovering, describing, and evaluating social status, structure, and development /.../ in social groups*” (Bronfenbrenner, 1943, p. 3). Influenced by sociometry, the field of social network analysis grew rapidly during the 60s and 70s due to an increasing interest among mathematicians. As a result of the lasting methodological focus on social networks, many scholars have argued that it is difficult to discern a general theoretical perspective (Scott, 1988; Wellman, 1983). Nevertheless, most social network researchers place emphasis on structures between social actors rather than the characteristics of the actors themselves (Knoke & Kuklinski, 1982). Due to this consensus, some argue that it is possible to talk about “*a theory of social structures*” (DeGenne & Forsé, 1999, p. 12; see also Knox, Savage, & Harvey, 2006).

In sum, social network analysis offers an epistemic link between the rather abstract concepts of social structures and empirical research (Burt, 1980) or, put differently, it facilitates a shift from regarding social networks as a metaphor to seeing them as something measurable.

### 3.1.2 Applying sociometry to measure networks

In the present thesis, the different structural aspects of the school class are measured through sociometry. The ‘sociometric test’ by means of which the school class structures in the empirical studies have been established, is a fundamental feature of sociometry (Loomis & Pepinsky, 1948). This test involves a procedure through which individuals are asked questions concerning who they prefer in different respects.

Four types of sociometric question are generally distinguished: task-specific, direct preference, friendship, and acquaintance (Terry, 2000). In this thesis, three of these types were used: one was task-specific (“*Whom do you best like working with in class?*”), one concerned direct preference (“*Which boy or girl in this class do you like best?*”), and one targeted friendship (“*Who are your three best friends in the school class?*”).

The development of sociometry has benefited from a number of disciplines such as social anthropology, psychology, mathematics and sociology. Given these diverse contributions, it is not surprising that sociometry has been subjected to intense debate among researchers. Several issues have been highlighted over the decades, of which some have immediate bearing on the work conducted within the frame of the present thesis. There are two particularly important features of the procedures used to obtain the sociometric information: firstly, whether the number of nominations is limited or unlimited and, secondly, whether both positive and

negative or only positive nominations are allowed. Importantly, the sociometric data used in the present thesis were based on limited (students were asked to make three nominations) and only positive nominations.

### *Limited versus unlimited nominations*

Moreno was a proponent of an unlimited procedure in which all participants could name as many others as they liked. With constraints on the number of nominations, Moreno (1951) argued, important theoretical constructs such as social isolation cannot be adequately determined. In the data used in the present thesis, the limit was set at three. It is possible that an individual may not have been categorised as isolated if a fourth or even a fifth nomination had been allowed. An additional consequence of the limited nomination procedure is that several network measures intended to capture the entire network structure (such as density or boundedness) are automatically ruled out, since the variation between school classes becomes restrained. It has also been claimed that measurement errors occur if, for example, an individual has five friends who he or she likes to play with equally much, but can only nominate three of them (for a detailed discussion, see Halinan, 1974; Holland & Leinhardt, 1973; Terry, 2000). There are, however, defenders of limited-nomination. Empirical studies demonstrate, for example, that distributions based on limited versus unlimited nomination procedures are very similar (e.g. Bjerstedt, 1955; Gronlund, 1959; Thompson, 1960; see also Yang, Wu, Lei, & Yang, 2009).

### *Positive and negative nominations*

In the early days of sociometry, it was common only to consider positive nominations (see e.g. Bonney, 1946; Hunt & Solomon, 1942; Northway, 1940), as it is the case with the present thesis. Gradually, however, researchers (primarily in the field of developmental psychology) started to make use of negative nominations (such as “*Who do you like the least?*”) when developing new classification systems in order to distinguish not only acceptance but also a dimension of rejection (for example, Coie, Dodge, & Coppotelli, 1982; Newcomb & Bukowski, 1983).

However, using negative nominations is not completely without its problems. Some researchers have expressed concerns about the potential adverse effects of asking children to identify peers whom they dislike (Asher & Dodge, 1986): the procedure may highlight and exacerbate the conditions of children who are already socially disadvantaged (Ollendick, Weist, Borden, & Greene, 1992). Moreover, it is possible that the negative aspects of the social structures of the school class are further cemented. Although studies show that negative nominations have no effect on children’s interactions (Hayvren & Hymel, 1984), it may still be seen as unethical that

adults encourage children to making rejecting statements about their peers (Asher, 1983; Moore, 1967).

### 3.1.3 Describing and analysing networks

The ‘sociogram’ has long played a central role in sociometry and social network analysis (for a review of the development of sociograms, see Freeman, 2000). A sociogram is a visualisation of the patterns of linkage in a social network (Moreno, 1934). In this introduction sociograms are used to illustrate the different aspects of the school class structure and to give an idea of how these constructs are linked to one another.

Figure 1 is an example of a sociogram that illustrates the overall school class network. Each circle represents an individual; the arrows demonstrate the direction of the nominations between these individuals. As can be seen in the figure, each individual was allowed to make three positive nominations, as was also the precondition for the sociometric data used in the present thesis.

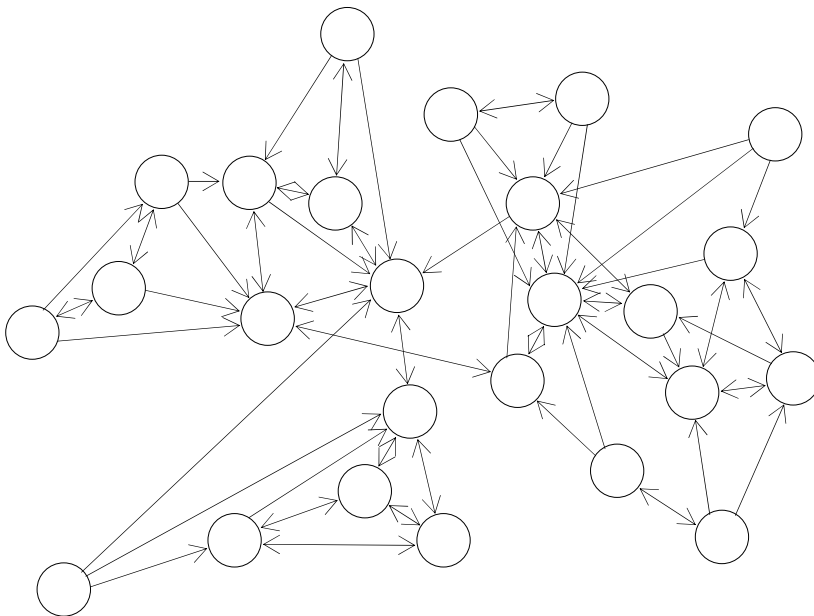


Figure 1. A sociogram of a school class network.

#### *Measures of overall network structure*

A sociocentric approach to networks involves a focus on the overall network structure. In the present thesis, three measures of network structure were constructed: ‘centralisation’, ‘degree of reciprocity’ and ‘proportion of isolates’. Degree of reciprocity was chosen to tap into the relational approach

while the positional approach is represented by centralisation. Proportion of isolates is an over-arching construct that is supposed to echo both these approaches. Although the three network measures were based on the same question ("*Which boy or girl in this class do you like best?*"), they were thus designed to capture partly different aspects of the overall school class structure, assumingly reflecting social integration at the class level (see Study I for a more elaborate discussion and empirical examples of different network structures). Below, a brief description of the measures is presented.

Centralisation involves the status dimension of the network, i.e. how equal or unequal school classes are in terms of status distribution. In less centralised networks, all individuals are centred on (or near) the mean for the number of received nominations: this is assumed to indicate high social integration. Highly centralised networks usually include very central (a great number of received nominations) as well as more or less excluded individuals (no or few received nominations), which may result in low social integration (de Nooy, Mrvar, & Batagelj, 2005).

Degree of reciprocity refers to the proportion of mutual relationships in the school class; i.e. how many of the nominations are reciprocated. How this measure may relate to the class's social integration is not completely straightforward. On the one hand, a high degree of reciprocity may be linked to a high level of pro-social behaviour, which ought to be beneficial for integration. On the other hand, it could indicate that classmates only interact in small configurations, such as dyads and triads, in which case the overall level of integration would be low.

Proportion of isolates refers to the share of individuals who are not nominated by any of his or her classmates. Since isolated children play a lesser part in the social life of the school class, a high proportion of isolates may reduce the overall level of social integration. This could possibly also increase the level of stress in the school class because of perceived threat: the higher the number of individuals who are excluded from peer activities, the higher the risk to oneself. On the other hand, there could well be 'safety in numbers': isolation may not be as stigmatising if there are many isolates.

### 3.1.4 Group dynamics

One of the key assumptions of social network theory is that the structure of a network has consequences for both the individual members and for the network as a whole, that act over and above the effects of the members' characteristics and behaviours (Klovdahl, 1985). One of the strategic areas for social network research is thus to link the social structures of relations and positions to the behaviours of the individuals (Marsden & Friedkin, 1994). However, social networks are not static structures but, rather, a multitude of dynamic and simultaneous processes. To understand how social



networks may constrain or facilitate individual behaviour, a discussion of these processes is necessary.

### *Social climate and integration*

To begin with, the classroom climate may be considered an important aspect of school class dynamics. Starting out as a bunch of individuals with similar tasks and goals, the dynamic processes which involve interactions and experiences on the part of all the members of the class give rise to a unique climate (Dreesman, 1982; van den Oord & van Rossem, 2002). This, in turn, is influenced by and also influences the students' overall feelings of belongingness and attraction to the group. This phenomenon can be referred to as 'cohesiveness' (Cota, Evans, Dion, Kilik, & Longman, 1995). Group cohesion has been defined in numerous ways; one describes it as "*a basic bond or uniting force*" (Piper, Marrache, Lacroix, Richardsen, & Jones, 1983, p. 95). The term cohesion has often been used interchangeably with another term: integration. The analogous meaning of them has been implied in previous theoretical work by, for example, Bogardus (1958, p. 207), who defines social integration as "*the uniting of separate entities into a cohesive whole*". Although the positive sides of social integration and cohesiveness are often in focus, one should not forget the presence of their anti-theses in a social network or group. For example, in his seminal work, Durkheim (1897/2002) argued that disintegration arises from the absence of cohesion in the social structure.

### *Group norms and conformity*

It is assumed that the degree of cohesion in the school class network will influence a child's tendency to adopt group norms. Norms have generally been described as a set of jointly negotiated rules for social behaviour (Sherif, 1936). Theories of social identity and self-categorisation have provided complementary approaches to group norms. Two major implications of group norms for individual behaviour may be distinguished. Firstly, the extent to which individuals conform to group norms reflects the extent to which they identify with the group and, secondly, individuals are motivated to conform to group norms that not only differentiate them from other groups but also reinforce similarities within the own group (Christensen, Rothgarber, Wood, & Matz, 2004). Research into conformity in young people's peer groups has particularly been discussed in terms of 'peer pressure' (Clasen & Brown, 1985). Studies of peer pressure have commonly focussed on how adverse behaviours are transmitted between young people (i.e. negative conformity). Examples of this are risky sexual behaviour, alcohol use, externalising problems and delinquency (Allen, Porter, & McFarland, 2006; Crockett, Raffaelli, & Shen, 2006; Kiuru, Burk, Laursen, Salmela-Aro, & Nurmi, 2010; Sullivan, 2006). However, peer

pressure may also act as a consolidator of positive group norms. For example, positive peer pressure has been found to increase prosocial behaviour, academic achievement and physical activity (Barry & Wentzel, 2006; Salvy et al., 2009; Wentzel, Caldwell, & Barry, 2004). Individuals are believed to conform to group norms because they believe that the norms are justified and improve the quality of group relations or because they fear sanctions by the others in the group (Wahrman, 1972). The price of deviating from group norms may be negative feedback (Heimer & Matsueda, 1994), rejection and reduced status (Braithwaite, 1989) or feelings of shame (Scheff, 1988).

### *Empirical studies*

Although there is growing scientific interest in school class networks, the number of studies addressing the influence of the overall school class structure on individual outcomes is still quite limited. The results of those studies which have been carried out suggest, for example, that the correlation between a child's delinquency and that of his/her peers is stronger in highly cohesive networks than in less cohesive peer networks (Haynie, 2001). Another study has shown that group influence on aggressive and deviant behaviour is stronger in peer groups of higher status; the authors conclude that group influences are moderated by group visibility within the larger peer context (Ellis & Zarbatany, 2007). Moreover, a child's school adjustment has been linked to the degree of integration and openness in the school class structure (van den Oord & van Rossem, 2002).

### **3.1.5 Dimensions of the school class network**

So far, the discussion has primarily viewed the school class as a sociocentric network. However, this thesis also intends to examine school class structures at the egocentric (i.e. the individual) level. Drawing inspiration from the division into relational and positional approaches (as presented in Table 1), the present thesis firstly targets individual's social relations within the school class, i.e. friendships with classmates. A second aim is to consider the individual's social status, or 'peer status', within the distribution of social positions in the school class. Social isolation taps into both these dimensions of ego networks and can be interpreted differently depending on whether one is looking at the relational or the positional approach.

Where research into children's networks is concerned, studies of friendships and of peer status have traditionally emanated from differing research traditions. However, over the past decade or so the interrelationship between these aspects has been acknowledged, resulting in the notion of two separate but overlapping dimensions of children's networks (Asher, Parker, & Walker, 1996; Buhrmester & Furman, 1986;

Bukowski & Hoza, 1989; e.g. Gest, Graham-Bermann, & Hartup, 2001; Hartup, 1989; Hartup, 1996; Sullivan, 1953; Vandell & Hembree, 1994).

Friendships and status positions in the school class are intricately intertwined and difficult to disentangle. The mutual relationship between these dimensions has been demonstrated by empirical research. For example, friendships are likely to improve social skills and teach children how relationships work (Hartup, 1996). These skills may in turn help to boost the child's position among his or her classmates. The level of acceptance and status may then influence opportunities for friendship formation (Bukowski, Pizzamiglio, Newcomb, & Hoza, 1996). However, the correlation between friendship and status position is far from consistent: studies have shown that children who are poorly accepted in the wider context of the school class may nevertheless have friends in the class, while children who are highly accepted may have no or few reciprocal friendships (Gest, et al., 2001; Parker & Asher, 1993; Wentzel & Caldwell, 1997). It is thus important not only to address these dimensions separately but also to examine how they are linked. Targeting social isolation as a third factor, relevant in studies of both friendships and peer status, may shed some light on this issue.

In the two following sections I will present a more detailed discussion of friendships and peer status, followed by a short section on social isolation as a potential bridge between these two approaches.

## 3.2 Social relations

Social scientists have long recognised social relations to be a key element in how we organise our social life (Fiske, 1992). One specific type of relation has been highlighted, namely friendship (Allan, 1998). Making and keeping friends is indeed a major concern for young people, who invest a great deal of energy in group social life in order to maintain friendships. It is not for nothing that friendship has been described as “*defining moments of childhood*” (Doll, 1996, p. 165). At the school class level, the degree of reciprocity in the school class was earlier put forward as of primary interest. The following section will focus instead on the individual child and his or her friendships with classmates.

### *Functions of children's friendships*

The scientific literature identifies a number of functions of children's friendships. These include similarity, reciprocity, proximity, affectivity and voluntarism (Doll, 1996; Hartup, 1989; Rubin, Bukowski, & Parker, 1998). Similarity (or homophily) refers to the tendency to form friendships with similar others, a phenomenon that has been well established in previous research (Nangle, Erdley, Zeff, Stanchfield, & Gold, 2004). For example, friendships are based on similarity in terms of age, gender, race, physical

traits, and behaviours (Aboud & Mendelson, 1996; Berndt, 1982; Cairns, Cairns, Neckerman, Gest, & Gariépy, 1988; Kupersmidt, DeRosier, & Patterson, 1995; Shrum, Cheek, & Hunter, 1988; Urberg, Degirmencioglu, & Tolson, 1998; Vitaro, Tremblay, Kerr, Pagani, & Bukowski, 1997).

Reciprocity implies, firstly, that friends have mutual liking for each other and, secondly, that the relationship must be affirmed by both parties. Proximity refers to boundaries that delimit the choice of friends. Thus, it constitutes a central dimension in the study of friendships in the school class, since the organisation of classrooms naturally influences the degree of student contact and thus the selection of friends. As Wellman (1988) argues: “*social structural features greatly determine the milieu in which dyadic ties operate*” (p. 36). Friendships are assumed to be voluntary and, as such, neither obligatory nor prescribed (Bukowski, Newcomb, & Hartup, 1996; Rubin, Wojslawowicz, Rose-Krasnor, Booth-LaForce, & Burgess, 2006). Finally, since children have more options in choosing their friends than in choosing their families or neighbourhoods, friendship ties are assumed to have affectivity as their major base of strength (Litwak & Szelenyi, 1969).

### *Friendship dimensions*

It has been suggested that friendships and their significance across the life course constitute a multifaceted framework with three distinct dimensions: having friends, friendship quality and identity of friends (Hartup & Stevens, 1997).

Having friends, or ‘friendship quantity’, is the main topic of interest in this thesis. A great many studies have examined the correlates of having friendships. Previous research shows, for example, that children with friends are more socially out-going and pro-social; have higher self-worth and self-esteem; and display high levels of altruism and affective perspective-taking (Bagwell, Newcomb, & Bukowski, 1998; Berndt, 1996; McGuire & Weisz, 1982). Children without friends, on the other hand, have been found to be more shy, timid, withdrawn, sensitive and unsuccessful at solving conflicts (Parker & Seal, 1996; Rubin, et al., 1998; Shantz & Shantz, 1985). There is not only a difference between having friends and not having friends, but it has also been demonstrated that the positive effects of friendships are cumulative: the more friendships, the stronger the beneficial effects (Nangle, Erdley, Newman, Mason, & Carpenter, 2003).

An illustration of friendship quantity can be seen in Figure 2. The circles represent individuals in the school class and the lines are nominations between these individuals. Thin lines are unilateral (one-way) nominations while the bold lines represent mutual nominations, i.e. friendships. The numbers within the circles correspond to the number of friendships for each individual, i.e. friendship quantity. This number can range from 0 (zero

friends) to 3 (three reciprocal nominations) in this particular case, since the number of nominations is restricted to 3.

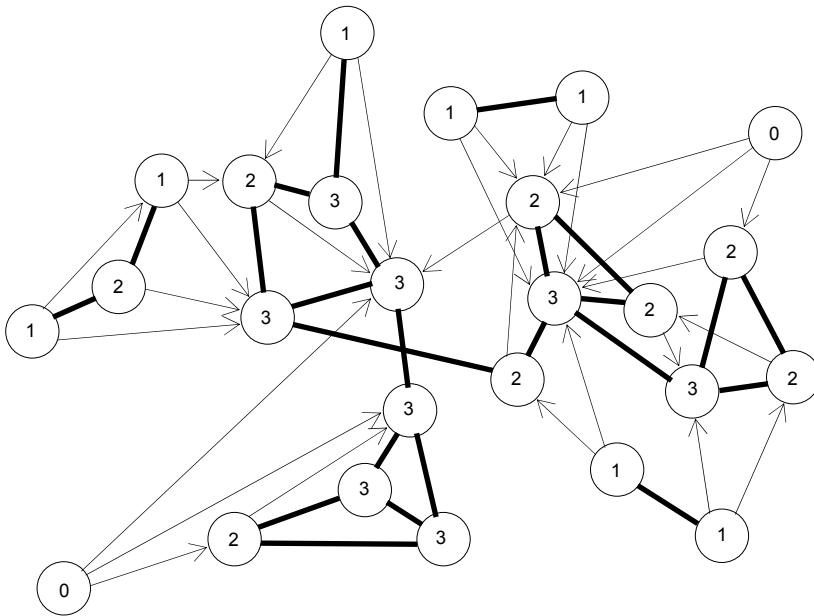


Figure 2. A sociogram of friendships in a school class.

The quality of friendships differs not only from one child to another but also between the friendships of one and the same child. Friendship quality has commonly been examined in terms of provisions as well as affective dimensions. Several studies have shown that positive friendships are correlated with, for example, higher self-esteem, less loneliness, wider peer acceptance, fewer behavioural problems and higher engagement (Berndt, 1996; Furman, 1996; Parker & Asher, 1993).

The third dimension in friendship research involves the selection of friends in terms of who the friends are. As previously discussed, friendship choice is fundamentally a function of similarity, but the characteristics of the members in a dyad are also important for the functioning of the friendship itself. For example, children who choose well-adjusted and socially competent peers as friends, display a higher conformity to group norms, have fewer behavioural problems and are better at managing stressful situations (Berndt, Hawkins, & Jiao, 1999; Hetherington, 1999). Such friendships are also characterised by more harmony, less conflict and less exclusion (Dishion, Andrews, & Crosby, 1995). In contrast, children who form mutual ties with peers who are similarly antisocial or socially unskilled,

experience more conflictual, less intimate and more coercive friendships (Dishion, et al., 1995; Gropeter & Crick, 1996) which also tend to reinforce the child's antisocial behaviour (Kupersmidt, et al., 1995).

### *Friendship and individual outcomes*

According to Hartup and Stevens (1997), a life-course perspective on friendship assumes that friendships influence subsequent outcomes. The findings of the few longitudinal studies which have been carried out demonstrate that mutual friendships predict short-term outcomes such as school performance, school perceptions and middle school transition (Kingery & Erdley, 2007; Ladd, 1990), and long-term outcomes, such as job performance, aspiration level, social life, activity interaction and trouble with the law (Bagwell, et al., 1998).

## 3.3 Social positions

Beside social relations, the notion of 'social position' is another key element in theories of social networks and structures (Borgatti & Everett, 1992). The fundamental idea is that individuals who occupy the same position are connected to the rest of the network in the same way (Borgatti & Everett, 1992). Moreover, positions within the network structure are attached to varying amounts of 'social status', which has led theorists to develop a notion of 'status structures' (Ridgeway, 2003).

I have already touched upon status distribution in terms of centralisation at the school class (or sociocentric) level of analysis. At the individual (or egocentric) level, the present thesis highlights the individual child's position in the status structure of the school class.

### *Peer status*

Young people spend a great deal of time and effort manoeuvring status positions in the peer group. Unlike most sociologists (with the exception of recent developments in research into perceived popularity in peer groups), developmental psychologists have shown wide interest in the distribution of social positions of children's peer groups, focussing on the construct of 'peer status'. Peer status has been operationalised in various ways in this field of research. The most common strategy is to use sociometric nominations to identify positive and negative peer interactions and subsequently to categorise individuals into different status groups: 'popular', who are liked by many peers and seldom disliked; 'rejected', who are frequently disliked and seldom liked; 'controversial', who are both disliked and liked by peers; 'neglected', who are neither liked nor disliked; and 'average', who do not fall into any of these categories (Newcomb & Bukowski, 1983).

### *Areas of research*

In developmental psychology, a primary aim has been to understand why some children become accepted and well-liked whereas others are rejected or neglected by their peers. Three major themes in research into peer status may be distinguished: early experiences that influence children's peer status; individual characteristics that contribute to the formation and maintenance of peer status; and the link between peer status and other outcomes (Gifford-Smith & Brownell, 2003).

The first area of research has thus examined the causes of peer status, chiefly various aspects of family influence. For example, disadvantaged social background, insecure attachment, marital discord, parents' social competence and child abuse have been linked to low peer status in children (Brendgen, Vitaro, Bukowski, Doyle, & Markiewicz, 2001; King, 1961; Ladd, 1999; Mikami, Jack, Emeh, & Stephens, 2010; Parke & Ladd, 1992; Parker & Herrera, 1996). A great deal of research has been devoted to individual characteristics, focussing on behavioural correlates of peer status. These studies have shown that individuals in high status positions are generally more helpful, friendly and considerate; academically and socially competent; cooperative; and follow rules (Cillessen & Mayeux, 2007; Coie, Dodge, & Kupersmidt, 1990; Newcomb, Bukowski, & Pattee, 1993). Individuals with low peer status tend to be more aggressive and disruptive; violate rules; bully and fight; or are shy, withdrawn and lack prosocial skills (Coie, et al., 1982; Ladd & Oden, 1979; Ollendick, et al., 1992; Prinstein & Cillessen, 2003). In a third area of research, peer status has been considered in terms of its influences on short-term and long-term developmental outcomes. Here, peer status has been linked to a wide range of outcomes, such as academic achievement (Schwartz, Hopmeyer Gorman, Nakamoto, & McKay, 2006; Wentzel & Asher, 1995), employment status (Woodward & Fergusson, 2000), adjustment difficulties (Parker & Asher, 1987), and behavioural problems (Coie, et al., 1990; Parkhurst & Hopmeyer, 1998).

### *Status and popularity*

The intuitive understanding of peer status may involve using the term 'popularity'. However, in the scientific literature peer status and popularity do not always refer to the same phenomenon. This is further highlighted in the gap between two distinct research traditions. While the first concerns the concept of peer status as developed by psychologists, the second originates from a sociological tradition and underlines the notion of 'perceived popularity'. Perceived popularity is defined as the subjective experience of the degree of acceptance by the members of the peer group. Furthermore, popularity can be seen as a unilateral concept that reflects the 'general opinion' of the group (Bukowski & Hoza, 1989). The most important difference between peer status and perceived popularity is that the former

relies on theoretical assumptions about what constitutes popularity while the latter imposes no a priori definition by the researcher.

It has been argued that peer status and perceived popularity constitute two overlapping but distinct dimensions (Cillessen & Rose, 2005). While peer status includes aspects of likability and degree of acceptance by peers, perceived popularity refers to the recognition among peers of achieved prestige, visibility and reputation (Adler, Kless, & Adler, 1992). The characteristics and behavioural profiles of individuals with varying amounts of status and popularity share several features (Lease, Kennedy, & Axelrod, 2002; Parkhurst & Hopmeyer, 1998). Both are, for example, associated with prosocial behaviour and self-confidence (Adler & Adler, 1998). Consequently, immature behaviour as well as passivity and social withdrawal lead to low status and low popularity alike.

There are also important divergences: perceived popularity is accompanied by more social prerogatives than peer status (Lease, et al., 2002) but is, on the other hand, positively associated with aggression, bullying and defiance (Cillessen & Rose, 2005). High peer status has been associated with positive adjustment while individuals in low peer status positions have been considered to be seriously at risk (Parker & Asher, 1987). Less is known about linkages between perceived popularity and developmental outcomes. It has been argued that perceived popularity has immediate rewards due to the individual's increased ability to achieve social goals (Hawley, 2003). However, since children who are perceived as popular are more likely to engage in risk behaviours (e.g. smoking) and display more aggression (Rubin, et al., 1998; Valente, Unger, & Johnson, 2005), long-term developmental outcomes may not be as favourable (Cillessen & Rose, 2005).

### *A vertical continuum*

An alternative approach to peer status, based on early sociometry as introduced by Moreno (1934) and then developed by scholars such as Gronlund (1959), Bjerstedt (1955) and Stütz (1985), has been used in research into the social determinants of health (see e.g. Almquist, Modin, & Östberg, 2010; Östberg, 2003; Östberg & Modin, 2007). This approach is also used in the present thesis.

This view of children's status positions is largely in accord with the concept of peer status favoured by developmental psychologists. Two important differences may, however, be distinguished. Firstly, greater importance is attached to the overall school class network structure. Peer status is thus not only conceptualised in terms of individual characteristics, but also viewed as a result of the structural features of the school class and the various group processes that it contains.



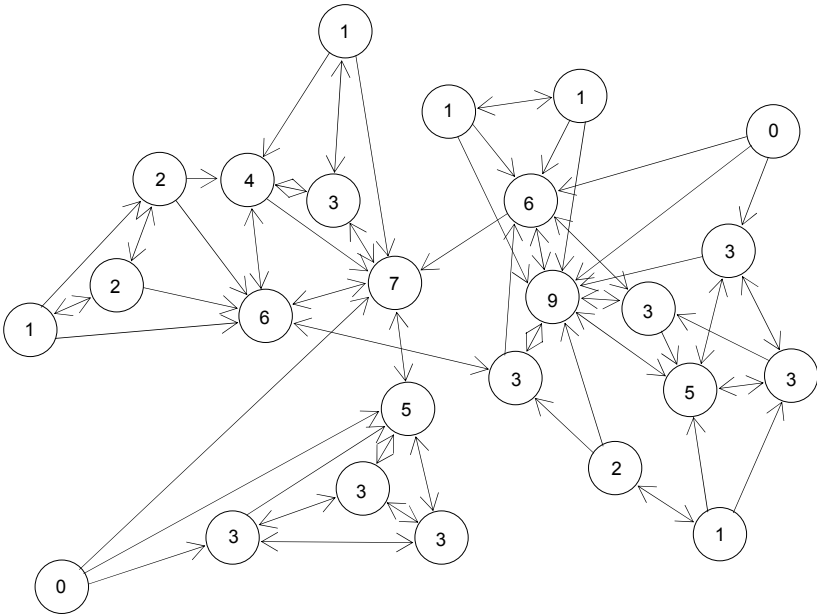


Figure 3. A sociogram of the distribution of social positions in a school class.

Secondly, developmental psychologists has been chiefly interested in the individuals in the lowest peer status positions (see e.g. Cillessen & Mayeux, 2004; Estell, Farmer, Pearl, van Acker, & Rodkin, 2008), who are often identified as rejected (Cillessen & Rose, 2005; Rubin, Hymel, Mills, & Rose-Krasnor, 1991). However, the common definition of peer status refers to the degree to which the child is accepted and liked by its peers (Newcomb, et al., 1993). The key word here is thus ‘degree’, which imposes a more structured approach to the grouping of individuals according to their number of received nominations. Consequently, instead of categorising children as popular, rejected, neglected, controversial or average, Östberg and colleagues have returned to a one-dimensional strategy involving only positive sociometric nominations to identify children’s peer status position in the school class. This enables us to place peer status categories along a vertical continuum, across which bottom positions indicate low status while top positions are linked to high amounts of status.

Figure 3 demonstrates the distribution of peer status. As in the previous illustrations, the circles represent children and the lines represent nominations. The numbers within the circles refer to the number of received nominations (i.e. the number of arrows that are directed towards the circle), indicating peer status.

### 3.4 Social isolation

In this thesis both the relational and the positional approach to social isolation are applied. In the former case, social isolation is referred to as 'friendlessness' while in the latter case it is called 'marginalisation'.

Friendlessness bears many resemblances to the notion of social integration, which is a key feature of both classical and contemporary sociology (Hughes & Gove, 1981). The converse of integration has commonly been conceptualised as social isolation, which refers to the objective characteristics of a situation in which an individual suffers from a relative lack of social interaction (de Jong Giervald, van Tilburg, & Dykstra, 2006). The detrimental aspects of social isolation are reflected in, for example, Durkheim's (1897/2002) work on suicide, in Tönnies' (1882/2001) distinction between *Gesellschaft* and *Gemeinschaft* society and in Simmel's (1908/1971) presentation of 'the stranger'. Sociologists have primarily focused on the structural aspects of isolation, which denotes the concrete participation of individuals in a network or a collectivity. Thus, social isolation (i.e. friendlessness) has been equated with an extremely limited social network (Lubben, 1988).

Marginalisation is linked to a partly different type of disintegration that concerns bottom positions in the overall structure of society. This notion goes back a long way to classical sociological work such as Marx and Engels' (1948/1998) discussion of the economic structure of work and property. It can also be found in structural functionalism, for example Parsons' (1961) identification of class as the major basis of stratification and Merton's (1938) paradigm of social structure and anomie. These ideas have been influential for the development of the concept of social exclusion, as linked to poverty and deprivation (see e.g. Townsend, 1979). In the school class, marginalisation refers to individuals who are at the very bottom of the hierarchy of social positions and, as a consequence, have low peer status.

In practice, there are no clear-cut lines between marginalisation and friendlessness: both refer to the phenomenon of disintegration and the disadvantages that it is accompanied by. As was discussed previously [3.1.5] an individual who is friendless is also likely to have very low peer status, and vice versa. Nevertheless, as was also discussed earlier, this correlation is far from perfect: for example, a child who enjoys relatively high status could still lack a mutual friendship in the school class. Thus, while we assume that friendlessness and marginalisation both tap into the similar phenomenon, the causes and consequences may differ to some extent.

An illustration of social isolation can be seen in Figure 4. As in the previous sociograms, the circles represent children in the network while the lines show the nominations (maximum of three) between individuals and the arrows the direction of these nominations. The bold circles represent class

members who are isolated (note that this particular sociogram does not distinguish between the two types of isolation).

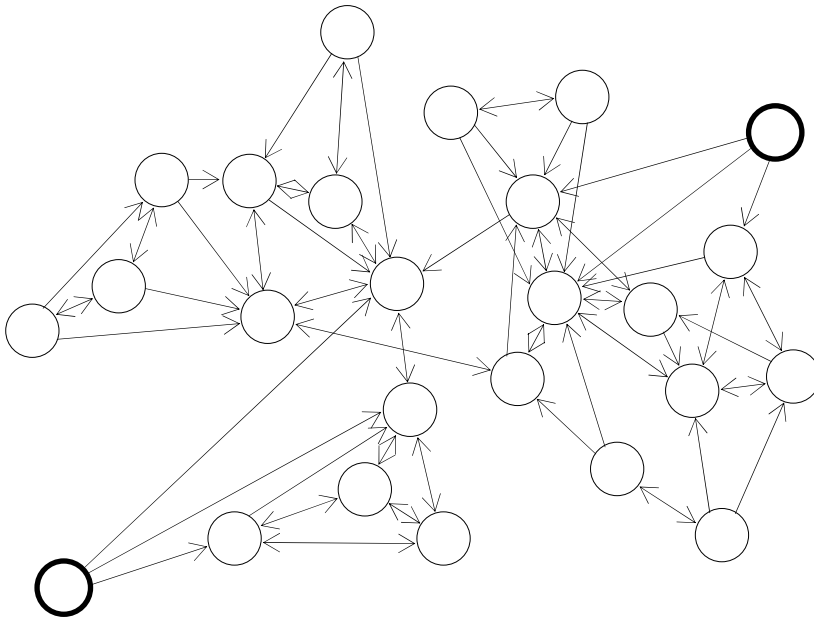


Figure 4. A sociogram of social isolation in a school class.

### 3.5 Pathways

The preceding sections of this introduction have presented a conceptual framework for the study of school class. I have not yet discussed potential mechanisms by which the social structures of the school class are linked to health across the life course. Consequently, the following section addresses an integrative life-course approach to potential pathways.

#### 3.5.1 Life-course theory

As previously stated, this thesis applies a life-course perspective to link school class network structures to health. Life-course theory has emerged as a central paradigm in the study of human lives (Elder, Kirkpatrick Johnson, & Crosnoe, 2003). Some have argued that life-course theory provides a general framework (Kuh, Ben-Schlomo, Lynch, Hallqvist, & Power, 2003) for examining “*the lives of women and men from birth to death*” (Diewald & Mayer, 2008, p. 3).

There are, however, some important divergences according to this approach. One such division is life-course sociology versus life-span

psychology: while the former views the life course as a social phenomenon (Hagestad & Neugarten, 1985), reflecting the intersection between social factors and personal biography (Elder, 1985), the latter focuses on individual factors, with social forces generally remaining outside the scope of inquiry (Settersten, 2009). The life-course approach has also become increasingly accepted in epidemiology, in the attempt to integrate the biological and social processes leading to later health or disease risk (Kuh, et al., 2003).

The life-course perspective applied in the present thesis is primarily built upon life-course sociology, focusing on the “*social structure of the life course*” (Diewald & Mayer, 2008, p. 4). Nevertheless, it draws inspiration from life-span psychology in examining the psychological processes that link the social structures of the school class to subsequent outcomes, and from life-course epidemiology when it comes to examining health as the outcome of choice.

### 3.5.2 School class conditions and health in a life-course perspective

One key area of life-course research is the conditions under which early-life experiences may affect subsequent life-course patterns (George, 1993, p. 363). The study of structural conditions in the school class and adult health clearly fits here. Thus, the aim of the present thesis is not only to establish a link between the school class context and later health, but also to investigate the potential pathways through which the influence of the school class structures may operate.

In the following sections I will, accordingly, discuss the mechanisms that may link structural conditions in the school class to adult health in various steps. This will result in a hypothetical model which is illustrated in Figure 5 (note: in the subsequent text, specific references to Figure 5 are made within brackets). This model, which is specific to this thesis, has drawn inspiration from other theoretical models by, for example, Berkman *et al* (2000). Needless to say, it is a simple representation of a complex reality; it is not possible to take all the loops and feedback loops into account. Moreover, the figure only includes influences originating from or passing through the school class.

#### *Childhood circumstances [A]*

All children bring with them a certain set of dispositions to the school class. These dispositions involve social positions (e.g. parental education, financial status and occupational class) and social relations (e.g. relationships and contact with parents, siblings and other peers). Obviously, each child also has a different make-up of individual characteristics and behaviours. All of this contributes to the composition of the school class and influences the

child's subsequent success with friendships and attainment of status positions (Almquist, et al., 2010; Armentrout, 1972; Parke & Ladd, 1992).

### *The school class [B]*

Beside the composition of children in the school class, other contexts also have a bearing [B]. For example, the class is located in a school which is located in a neighbourhood that is part of a certain society. These factors shape the social interaction and climate in the classroom. Teachers also play an influential role.

In the present thesis, school class structure is seen in terms of the overall class network and the ego-networks that emerge in the classroom. Social relations [B1] and social positions [B2] are both focused on at these two levels of analysis. At the school class level, the patterning of friendships and the distribution of peer status is of greatest interest; at the individual level it is the child's own success (or failure) with friends as well as his or her own position in the peer status hierarchy. Additionally, some children are exceedingly disadvantaged in terms of status and friends, resulting in various forms of isolation.

Although Figure 5 only demonstrates a one-way arrow going from childhood circumstances [A] to the school class [B], the scientific literature indicates that conditions and circumstances in the school class also influence individual characteristics and behaviours (e.g. Chen, Chang, Liu, & He, 2008; Espelage, Holt, & Henkel, 2003; Maruyama, Miller, & Holtz, 1986). Thus, a double-headed arrow is entirely feasible in this specific case.

### *Resources and opportunities [C]*

It is argued that the structural aspects of the school class result in a differential distribution of resources and opportunities among network members (Granovetter, 1974; Lin, Ensel, & Vaughn, 1981). At least two major pathways, to some extent overlapping, can be identified. On the one hand, social relations involve varying degrees of resources such as social support. [C1]. The concept of social support has often been used in a broad sense to indicate any process through which social relations may be beneficial for health (Cohen, et al., 2000). Commonly, social support has been divided into four categories (House, 1981): instrumental (time, material goods and money), informational (guidance and advice), appraisal (evaluative feedback) and emotional (trust, love and companionship).

On the other hand, social positions include the opportunities which are linked to the individual's social status [C2]. Individuals at the top of the status hierarchy occupy central roles in the peer group and are respected and admired (cf. Ridgeway & Walker, 1995). As such, they are more likely to receive important information and to be able to influence the attitudes and behaviours of others, whereby they gain a large amount of power and control

in the classroom context (Ibarra, 1993; Israel, 1963). Social power includes the individual's "*effectiveness at directing, coordinating, and sanctioning the activities of other members*" (Hartup, 1984, p. 253).

Although it is reasonable to assume that social relations may have a direct influence on subsequent life chances, it may also attenuate the adverse effects of the stress caused by having a low social position. This distinction taps into a widely debated issue: advocates of the 'stress-buffering' hypothesis have argued that social support protects individuals from the consequences of stressful conditions. Advocates of the 'main effect' model, on the other hand, suggest that social relations are important regardless of the level of stress (for a more detailed description, see e.g. Cohen, et al., 2000). In the present study I nevertheless focus on the main effect model. In other words, although friendships may attenuate the negative consequences of having lower peer status, I make the assumption that friendships are important for life chances regardless of whether the individual is under stress or not.

The conditions in the social network of the school class as a whole may also be significant for the overall level of opportunities and resources. Highly-integrated school classes are likely to have a more positive social climate which may have beneficial effects for all students regardless of their own success with friendships and peer status.

Lastly, it should be added that there are several other types of resource and opportunity that are of importance in this context. Perhaps the most relevant ones concern the scholastic ability and the academic achievements of the students. Such aspects will, both independently and by interplaying with resources linked to relations and positions, undoubtedly influence children's subsequent life chances.

### *Psychosocial mechanisms [D]*

It is assumed that there is a degree of convergence of social support and social status, via certain psychosocial mechanisms, in their influences on individual life chances. These mechanisms include, but are not limited to, expectations, emotions, behaviours, ambitions and choices (cf. Östberg, 2003; Östberg & Modin, 2007). The issue of expectations is a central notion in the social psychology of, for example, Mead (1934). Mead's theory takes its starting-point in social interaction as something that precedes the establishment of an individual's consciousness. Through the socialisation process the individual assumes the expectations of 'the generalised other' (i.e. the views of society), which become incorporated with the individual's identity. In the context of the school class, someone who is successful in forming friendships and attaining high peer status positions is, at the same time, someone who has successfully met the normalised expectations of

others. Importantly, individuals who are friendless or have low status have also met the (negative) expectations of others.

This thesis further presupposes that internalised expectations involve beliefs about one's potential, which subsequently influence the individual's ambitions in life, the types of behaviour that are enforced or restrained, and the choices he or she makes. An additional mechanism involves the emotions that arise from the individual's experiences of the school class context. Being socially integrated in the classroom may result in feelings of belongingness, security, self-worth, stability, a sense of purpose (Anant, 1966; Cohen, et al., 2000; Thoits, 1983) and motivation (cf. Urdan & Schoenfelder, 2006). Social isolation may lead to a sense of alienation, lack of control and increased negative affect (Cohen, et al., 2000).

### *Achievements [E]*

Through these mechanisms, the child's relations and position in the school class become important for his or her subsequent achievements in terms of establishing social relations [E1] and social positions [E2] in adult life. As was mentioned in the introduction, these two aspects have been seen as important social determinants of health [see 1.1]. Needless to say, these kinds of achievement (e.g. educational attainments) in adulthood could supposedly mirror the circumstances in childhood (e.g. school marks) to a large extent.

Key aspects of social relations in adulthood are the personal network of family, friends and colleagues; personal contacts (e.g. close or intimate); and overall social participation (in society at large or in organisations). As for social relations in the school class, adult relations are assumed to involve varying degrees of social support which may have main effects on health (or, alternatively, buffer the adverse consequences of stress) (Cohen, et al., 2000; Cohen & Wills, 1985). When it comes to social positions, attained socioeconomic status, as indicated by educational level, financial status or occupation, are important.

It is also plausible that the overall school class network may leave its mark on the types of network that the individual subsequently seeks out and has the opportunity to join.

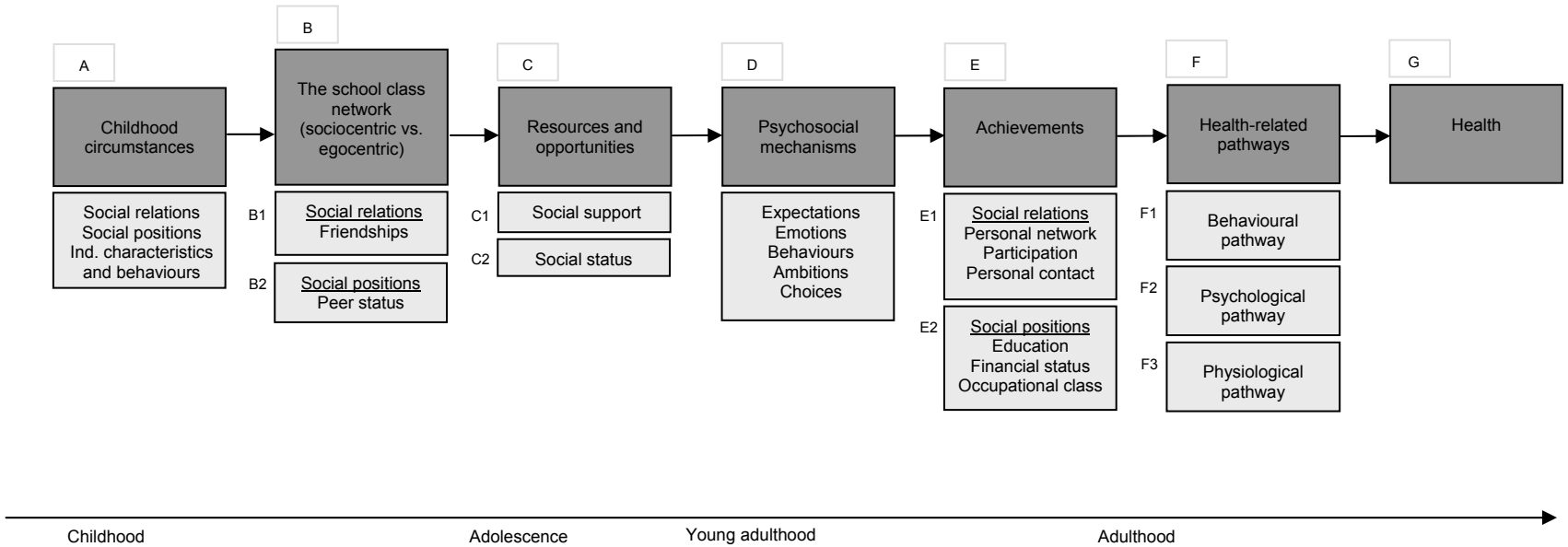


Figure 5. A hypothetical model of pathways linking the conditions in the school class to health in a life-course perspective.



### *Health-related pathways [F]*

The advantages or disadvantages, in terms of achievements, may in turn be channelled via three main pathways to health: the behavioural, the psychological and the physiological (cf. Berkman, et al., 2000). In the case of the behavioural pathway [F1], the present thesis assumes that risk-related behaviours, such as smoking and high alcohol consumption, may in fact be a method of dealing with stress (Krueger & Chang, 2008). Additionally, it has been hypothesised that individuals in different social strata (e.g. based on social class) or social networks also differ in their dominant attitudes towards certain health behaviours and thus also in their patterns of these behaviours (Williams, 1995).

The psychological pathway [F2] includes aspects of coping effectiveness, self-efficacy and self-esteem (Berkman & Glass, 2000). Individuals who are disadvantaged in terms of social relations and positions may have fewer resources and may lack functional and adaptive styles of coping with stress and negative feelings of self (Bosma, van de Mheen, & Mackenbach, 1999; Holahan & Moos, 1987). They may also be more likely to feel that they are helpless and not in control of their lives, which could result in lower self-esteem (Gecas & Schwalbe, 1983; Holahan & Holahan, 1987; Syme, 1998).

The physiological pathway [F3] affects, for example, the allostatic load and the immune functioning system: stress and adverse conditions may be linked to physiological responses such as elevated levels of corticosterone and cortisol, poor adrenocortical recovery and raised blood pressure, which in turn influence immune functioning and the individual's susceptibility to disease (for a review, see Berkman & Glass, 2000). Moreover, risk-related behaviours (e.g. smoking, poor diet, alcohol consumption and unprotected sex) as well as being exposed to hazardous contexts or situations (e.g. risks in the work place, poor material conditions, unsafe residential area) may directly affect physical health (see e.g. Blane, Bartley, & Davey Smith, 1997).

### *Health [G]*

To conclude, the hypothetical model presented here demonstrates the advantages or disadvantages which stem from or are mediated through the social context of the school class as they interact over the life course. Stress is a considerable underlying factor in this model.

Stress has been widely discussed in research into the relevance of a psychosocial perspective of the social determinants of health. This assumes that individuals who are disadvantaged in terms of relations and social position are either exposed to more stressful experiences (Pearlin, 1989; Turner, Wheaton, & Lloyd, 1995) or have a lower capacity to deal with the stress they are exposed to (Aneshensel, 1992; Lundberg, 1997). The psychosocial perspective does not, however, encompass all possible links

between social structure and health. As was discussed earlier, material conditions and health-related behaviours are important in explaining health disparities. Nevertheless, the psychosocial perspective attempts to disentangle some the complexity of health development across the life course. Moreover, one of its major advantages is that it takes its starting-point in the *social* determinants of health (cf. Elstad, 1998).

Again, the hypothetical model presented here is greatly simplified. In particular, health does not simply emerge in adulthood; it is constantly present and, as such, is likely to mutually influence social positions and social relations across the life course, especially those that emerge in the context of the school class [for a further discussion about causality, see 6.3].

### 3.6 Gender differences

So far, this introduction has not commented on gender differences in school class networks and their influence on health. Most empirical evidence supports the notion of a ‘sex cleavage’ in children’s peer groupings: sociometric nominations seldom cross the ‘gender border’ (Maccoby & Jacklin, 1987). Thus, gender is indeed an underlying segregating principle for children’s social interaction. There is however still no consensus with regards to whether the structure and content of children’s peer interactions differs according to gender.

#### *Gender differences in peer structure*

In the discussion of structural aspects of peer networks, it has been maintained that boys form larger clusters while girls mostly interact in smaller clusters or dyads (Benenson, Apostoleris, & Parnass, 1998; Maccoby, 1990; Maccoby, 1998). This notion is primarily based on observational studies; few studies have quantified gender differences in interaction patterns (for a review, see Rose & Rudolph, 2006). Quantitative studies have in fact shown that boys’ and girls’ clusters do not differ according to size (Bagwell, Coie, Terry, & Lochman, 2000; Cairns & Cairns, 1994) and, furthermore, that no systematic gender differences in tight-knittedness or salience of status hierarchies seem to exist (Gest, Davidson, Rulison, Moody, & Welsh, 2007).

#### *Gender differences in the content of peer interactions*

When looking at gender differences in the content of peer interactions and relations, some researchers have claimed that given the same-sex preference, children grow up in two distinct cultures. Girls’ relationships are seen to be more dyadic, exclusive, self-disclosing and intimate while boys’ relationships are characterised by competition, dominance and participation in mutual activities (Belle, 1989; Eder & Hallinan, 1978; Rose-Krasnor, 1997). This view has been criticised for being static and exaggerated; it has, furthermore,

been contradicted by much of the evidence (Thorne, 1993). Nevertheless, one may assume that although the content of girls' and boys' networks does not differ to any great extent, there may still be some differences in the causes and consequences of peer interaction in the classroom.

### *Gendered pathways*

In the hypothetical model proposed above, no special attention was paid to gender. It is assumed that both boys and girls who are socially disadvantaged in the school class (e.g. those who have low peer status, fewer friends or are isolated) have a general susceptibility to ill-health. This is expected to be applicable to most health outcomes, even though the prevalence of particular diseases often differs for men and women. Nevertheless, there may be gender differences in terms of the pathways that link school class experiences to health across the life course. For example, stress is considered an underlying factor in the hypothetical model. Studies have shown that women tend to report higher levels of stress linked to their social networks, while men's stress is more associated with issues such as job loss and difficulties at work (Kendler, Thornton, & Prescott, 2001; Kessler & McLeod, 1984). Such adult circumstances among men have also been linked to disadvantages in the school class (Östberg & Modin, 2007).

How gender may moderate the pathways between classroom conditions and later health remains a deeply complex issue which needs to be further examined in future research.

## 3.7 School class structures and health: previous empirical findings

The preceding parts of this chapter have elaborated on a joint theory for the study of the school class as a social context as well as the pathways through which school class structures may influence health across the life course. The next part of this introduction presents an overview of studies that have been conducted in the field of school class influences on health - although it is actually inaccurate to refer to these studies as part of a 'field' in any traditional sense. It is rather the case that various disciplines have contributed to a fragmented understanding of school class structures and health, using a variety of theories and methods.

The following criteria were applied in this overview: 1) school class structure must involve contextual aspects in terms of aggregated measures of network structure or objectively measured aspects at the individual level, such as friendship quantity and peer status. In the case of social isolation, it has commonly been implicitly included in research into friendship quantity (friendlessness) as well as peer status (peer exclusion, rejection or neglect). 2) Only studies that review psychological and physical health outcomes are

included. This precludes health-related behaviours such as smoking, alcohol consumption and exercise as well as behavioural problems such as aggression and delinquency. This is because this thesis views such behaviours as mechanisms through which the school class influences subsequent health.

In the following section I begin by looking at the cross-sectional study of school class and health and then move on to an overview of longitudinal studies of the influence of the school class on health.

### 3.7.1 Cross-sectional studies

Firstly, a number of multilevel studies have addressed differences between school classes in terms of health. One study by Van den Oord and Rispen (1999) found an 11 % variation in psychological well-being, using a sample of 1,282 4- to 5-year-old Dutch children in 94 school classes. In a sample of 7,930 Swedish 9th grade students in 475 school classes, 1.9 % of the variation in subjective health could be attributed to the school class (Modin & Östberg, 2009). Another study, by Torsheim and Wold (2001), found a 5.6 % variation in health complaints at the school class level, in a sample of 1,585 8th grade Norwegian students from 82 classes. A study by Hansell (1985), involving 254 students in the 9th grade showed that higher network density was associated with more psychosomatic symptoms.

A number of cross-sectional studies have included aggregated measures of the school class as a social network in relation to health. Östberg's (2003) study of 13,932 Scottish students in 524 classes demonstrated that school classes which had no students in the lowest peer status positions and those without students in the highest peer status positions had a lower overall level of malaise. In a multilevel study by Karvonen *et al* (2005) of 60,347 Finnish 8th and 9th grade students in 109 schools, it was concluded that a poor class spirit was associated with a higher degree of health complaints at both the individual level and at the school level.

Considerably more research into friendships and health in young people is available. Several of these studies found that friendship quantity was associated with the prevalence of depressive symptoms. For example, Field *et al* (2001) showed that number of friends was linked to depression in a sample of 79 American high school students. In a sample of 193 American 3rd to 6th grade students Erdley *et al* (2001) found that the number of friendships was predictive of depression. In a large-scale study of 11,023 American students, the results demonstrated an association between the number of friends at school and depressive symptoms (Ueno, 2005). Demir and Urberg (2004) showed that the number of mutual friends was correlated with depressed mood in a sample of 618 American 8th, 10th and 12th graders. A study by Sund *et al*, involving 2,465 Norwegian students in the 8th and 9th grades found that having several friends seemed to be protective

of depressive symptoms (2003). Where subjective well-being is concerned, children who reported that they had many friends were also happier. This result came from a study of 817 Canadian students in 4th through 6th grades (Holder & Coleman, 2007). Brolin Låftman and Östberg (2006) showed in their sample of 5,137 Swedish students aged 10-18 that those who did not have a best friend in the school class reported more psychological complaints. The association between having no close friends and a higher degree of psychosomatic complaints was established in a study by Berntsson and Gustafsson (2000), based on a sample of 1,163 Swedish children aged 7 to 12 years. Due *et al* (2003) demonstrated in their study of 5,205 Danish students from grades 5, 7 and 9, that those with less than two close friends were more likely to report psychological symptoms. A study of 166 Finnish children showed that friendlessness at age 7-8 was associated with anxiety and depressive symptoms (Laursen, Bukowski, Aunola, & Numri, 2007).

When it comes to cross-sectional studies of peer status, many have focussed on health. In her study, Östberg (2003) found a gradient in malaise by peer status. Moreover, in a study by Walsh *et al* (2010) of 3,499 Israeli-born and 434 immigrant adolescents aged 11, 13 and 15, it was concluded that being rejected by peers (i.e. receiving no positive nominations and several negative nominations) predicted somatic and emotional health. Peer rejection also predicted poor emotional health in a study by Lopez and DuBois (2005) of 508 American 5th and 6th grade students. A higher prevalence of depressive symptoms has been linked to peer rejection in several studies. One of these is a study by Boivin *et al* (1994) of 140 Canadian 4th graders; another involved samples of 1,464 and 750 American students in the 4th grade (Cole, 1990; Cole & Carpentieri, 1990). Similar results were shown in a study of 4,881 4th to 9th grade Dutch students (Güroglu, van Lieshout, Haselager, & Scholte, 2007), and in the previously mentioned studies by Hansell (1985) and Ueno (2005). Anxiety is an additional health outcome that has been addressed in this line of research. For example, in a study of 973 American students in 6th to 9th grades, Inderbitzen *et al* (1997) found that social anxiety was more common among those who held low peer status positions. Lower peer status has moreover been linked to increases in suicidal ideation over a two-year period in a sample of 493 American students in grades six to eight (Heilbron & Prinstein, 2010).

### 3.7.2 Longitudinal studies

Given the limited number of cross-sectional studies of overall school class structures and health, it is not surprising that longitudinal studies do not seem to exist (or they are at least well-hidden). Given the increasing interest in network studies, however, more empirical work may be expected in the future.

Although friendship has been a well-examined topic in cross-sectional studies, longitudinal studies are scarce. In a study by Bearman *et al* (2004) of 13,465 American students in the 7th to 12th grade, it was found by means of a sociometric procedure that those who had no friends to nominate, were not nominated by others or nominated individuals who had no other friends, had a greater risk of attempting suicide one year later. A study by Ladd and Troop-Gordon (2003) based on a sample of 399 American children followed annually from kindergarten to 4th grade, showed that friendlessness was predictive of psychological ill-health. Bagwell *et al* (1998) conducted a study of friendships among 334 American 5th graders, of whom 60 students were followed up at age 23. The results indicated that those who were friendless in 5th grade were more likely to have psychopathological symptoms at follow-up. This pattern was also demonstrated when these individuals were additionally followed-up at age 28 (Bagwell, Schmidt, Newcomb, & Bukowski, 2001).

Several studies have focused on the impact of peer status on short-term health outcomes. For example, a study by Borelli and Prinstein (2006) of 478 American 6th to 8th graders showed that peer status was related to depressive symptoms 11 months later. In a sample of 585 American students, Fontaine *et al* (2009) showed that peer status in kindergarten through 3rd grade predicted anxiety and depression in 7th to 9th grade. A study by Ollendick *et al* (1992) of 267 American students showed that low peer status in 4th grade was linked to poor psychological health five years later. In a sample of 215 Italian students, Keisner (2002) demonstrated an association between peer status in the 6th and 7th grades and depressive symptoms two years later. Low peer status was also linked to an increase of depression in the following two years in a study by Panak and Garber (1992) of 521 American students in the 3rd to 5th grades. There are, additionally, a number of studies that focus on peer status and longer-term outcomes. A study by Roff and Wirt (1984) of 2,453 American students showed that low peer status at age 8-10 predicted poor mental health in young adulthood. Cowen *et al* (1973) found that peer status in the 3rd grade predicted psychiatric difficulties 11-13 years later. That result was based on a sample of 537 American students. A study by Bagwell *et al* (2001) of 60 American students in the 5th grade demonstrated that low peer status predicted mental health problems at ages 23 and 28. Östberg and Modin (2007) based their study on a sample of more than 6,000 individuals and found that lower peer status among Scottish 3rd to 7th grade students was predictive of an increased risk of less than good self-rated health and limiting longstanding illness in middle adulthood. In a study of 5,242 Swedish female students by Modin, Östberg and Almquist (2010), lower peer status in grade 6 was associated with an increased risk of hospitalisation for anxiety and depression in adulthood.

In studies of the influence of school class on short-term and long-term health outcomes, social isolation is (as for cross-sectional studies) often implicitly included. Nevertheless, a number of studies have targeted social isolation per se. Caspi *et al* (2006) used a cohort study of 980 individuals born between 1972 and 1973 in Dunedin, New Zealand. Information on social isolation (objectively measured loneliness and low peer acceptance) was gathered at age 5, 7, 9 and 11 from parents and teachers. Socially isolated children were more likely to have poor physical health at age 26. The Dunedin cohort was also used in a study by Danese *et al* (2009) of 972 cohort members. The results suggested that those who were socially isolated in childhood were at greater risk of being diagnosed with major depression and/or of having a clustered metabolic risk at age 32.

### 3.8 Outline of the present studies

From the overview, it is clear that a large proportion of studies of school class in relation to health have used small samples. In order to draw more robust conclusions, larger-scale studies are required. Moreover, not all the studies based their measurements of school class structure on information gathered from the children themselves, thus losing the child perspective. The use of sociometric information (although there are alternatives) facilitates a more objective, child-oriented assessment of structures in the classroom. With only some exceptions, the cross-sectional and longitudinal studies that were reviewed have looked at psychologically-related health outcomes: if children who are disadvantaged in the social structures of the school class are assumed to have a general susceptibility to disease, a wider range of health outcomes must be considered. Another issue concerns data design. There are far more cross-sectional than longitudinal studies of the relationship between social structures in the classroom and health. A longitudinal data design is more demanding but is nevertheless necessary to be able to understand structural influences on health across the life course. A further consequence of the lack of longitudinal studies is that it has not been easy to examine the pathways through which the school class network influences later outcomes.

The empirical studies included in the present thesis respond to these issues by using large-scale longitudinal data materials that contain sociometric assessments, a variety of health outcomes and information about several potential mechanisms. The studies are also designed to address some more specific issues identified in the overview; these are presented below.

#### Impact of overall school class structure on concurrent and subsequent health

A number of previous studies have looked at overall school class network structure and its impact on health. They demonstrate that simple network

measures such as density are related to health. Although the interest in social network analysis is currently growing, it is hindered by the designs of many existing data materials: network studies must apply multilevel analysis to reveal the contextual effects of the school class structure on health. Moreover, and even more importantly, there do not appear to be any longitudinal studies of network influences of the school class on health. Hence, the purpose of Study I was to examine contextual effects of the school class on child and adult health. Three measures of the overall network structure, assumed to tap into aspects of social integration at the contextual level, were calculated: centralisation (status distribution), degree of reciprocity (proportion of reciprocal ties) and proportion of isolates. The health outcomes were minor psychiatric disorder in childhood and self-rated health in adulthood. Several structural factors were included as potential confounders (grade, proportion of absentees and proportion of boys). Measures at the individual level, equivalent to these network measures, were additionally accounted for.

### Long-term consequences for health of childhood friendships

A very large number of cross-sectional studies have investigated the association between friendship quantity in the school class and various health outcomes. Most of these studies found the number of friendships with classmates to be associated with an elevated level of psychological and psychosomatic problems. Few researchers have, however, focussed on the longer-term influences on health of school class friendships. For this reason, the aim of Study II was to examine whether there is an association between friendship quantity (i.e. the number of reciprocated nominations) and self-rated health in adulthood and, if so, whether this association could be explained by childhood circumstances (socioeconomic status, family composition and individual characteristics) and adulthood circumstances (socioeconomic status, family composition, health-related behaviours and social support).

### Influences of peer status on broader health outcomes

Previous studies have established the association between children's peer status and health in childhood: low peer status seems to be associated with a wide range of psychological, emotional and psychosomatic problems. However, many studies have only looked at the peer status in terms of those who are rejected by their peers. An important exception is the research carried out by Östberg and colleagues, in which peer status has been examined as a continuum in relation to health. The health outcomes studied in relation to peer status hitherto have primarily focused on psychological or self-reported health. Study III therefore sought to examine the association



between peer status (the number of received nominations) and a wide range of disease-specific health outcomes in adulthood.

### **Simultaneous assessment of different types of social isolation and health across life**

Social isolation has often been implicitly included in studies of friendship quantity and peer status and has been seen to be linked to health among children and adults alike. A small number of studies have addressed both of these types of isolation simultaneously, although few of them are longitudinal. The overall purpose of Study IV was therefore to examine social isolation, in terms of both relations (friendlessness) and positions (marginalisation) in the school class and its association with disease across the life course. The health outcomes included in-patient care overall and in-patient care for mental and behavioural disorders. Various individual, school-related and family-related factors were additionally included in this study: scholastic ability, externalising problems, internalising problems, socioeconomic status and family and home environment.

## 4. Data materials and measurements

This chapter describes the data materials upon which the present thesis is based and, briefly, how school class structure and health were measured. [A more critical discussion follows in Chapter 6.]

### 4.1 Data materials

Two longitudinal data materials were used: the *Aberdeen Children of the 1950s Cohort study* (Study I and Study II) and the *Stockholm Birth Cohort study* (Study III and Study IV).

#### 4.1.1 The Aberdeen Children of the 1950s Cohort study

Aberdeen is located on the North East coast of Scotland in the Grampian region. It is a comparably small city (although the third largest in Scotland) with a population of 187,000 in 1961. The geographical mobility of the population has been rather low, which means that the majority of cohort members were resident in Aberdeen throughout the study. During the 1950s and 1960s the Aberdeen economy was dominated by declining traditional low-wage industry and housing was in a poor condition. Health and educational services were, in contrast, outstanding compared to the rest of Scotland. The discovery of oil in the early 1970s transformed Aberdeen into one of the most affluent cities in Scotland, and social differences in health have declined since then (Batty et al., 2004).

The Aberdeen Children of the 1950s Cohort study is based on participants in the Aberdeen Child Development Survey (ACDS). The ACDS consists of all children who attended grades III-VII of compulsory school in Aberdeen in 1962 (see Batty, et al., 2004 for a more detailed description of the data material). In sum, the ACDS population includes 14,939 individuals.

The ACDS was divided into three phases, of which the first and second comprised cognitive tests and medical examinations. The third phase took place in 1964, when sociometric and teacher-rated behavioural information was collected (Batty, et al., 2004). A total of 13,945 children took part in the sociometric test. Approximately half of the attrition is primarily due to children moving from Aberdeen while the remaining attrition is due to the exclusion of special schools (e.g. schools for deaf or blind children) and the fact that some schools (and students) did not want to participate. At the

same time, some individuals had been moved up one grade due to good results in school tests and their classmates were included as well in the sociometric test.

A new database, Aberdeen Children of the 1950s Cohort study, was created in 1999 when 12,150 individuals from the ACDS (who had to have been born in Aberdeen Maternity Hospital in 1950-1956) were followed up with information on mortality, sickness and health (Leon, Lawlor, Clark, & Macintyre, 2006). Ethical approval for the revitalisation of the Aberdeen Children of the 1950s Cohort study was given by various ethical committees, including the Scottish Multi-Centre Research Ethics Committee, the Local Research Ethics Committee for Grampian, the Tropical Medicine Research Ethics Committee and the Scottish privacy advisory committee.

In 2001-2003, cohort members who were alive and not lost to follow-up for other reasons such as emigration, institutionalisation or being in the armed forces, were asked to answer a health questionnaire distributed by mail. Over 97 % (n=11,727) were successfully traced. Previous comparisons between the traced population and the non-traced population showed that while the two groups were similar in most respects, the traced population was somewhat more advantaged in terms of, for example, childhood social class (Batty, et al., 2004).

A total of 63 % (n=7,183) of the traced population returned the questionnaire. The response rate was lower among males and those who had unmarried parents at birth, had more siblings, were shorter and heavier in childhood for their age, had higher Rutter B2 scores, had lower cognitive scores, and were in a manual social class during childhood (Nishiwaki, Clark, Morton, & Leon, 2005). Of special interest for the present thesis, non-response was more common among those who had lower peer status and fewer friends in the school class.

#### 4.1.2 The Stockholm Birth Cohort study

The Stockholm Birth Cohort study (SBC) was created in 2004/2005 by a probability matching of two longitudinal studies: The Stockholm Metropolitan Study (SMS) and The Swedish Work and Mortality Data Base (WMD). The probability matching procedure was based on a matching algorithm that included 13 variables identical to both datasets. For a more detailed description of this procedure, see Stenberg *et al* (2006). Ethical permission for the probability matching was obtained from the Stockholm Regional Ethical Committee (no. 739-03-629) and approved by the Board of Health and Social Welfare and by Statistics Sweden.

Table 2. Description of the variables according to data material, year and study.

	Variable	Data material		Year	Study
		Aberdeen	Stockholm		
School class measures	Centralisation	x		1964	I
	Degree of reciprocity	x		1964	I
	Proportion of isolates	x		1964	I
	Friendship quantity	x		1964	II
	Peer status		X	1966	III
	Social isolation		X	1966	IV
	(friendlessness/marginalisation)				
Health outcomes	Minor psychiatric disorder	x		1964	I
	Self-rated health	x		2001	I/II
	In-patient care		X	1973-2003	III/IV
Structural factors	Individual indegree	x		1964	I
	Individual reciprocity	x		1964	I
	Grade	x		1964	I
	Absence	x		1964	I
	Proportion of boys	x		1964	I
Socioeconomic status	Parental social class	x	X	1962/1963	II/III/IV
	Parental income		X	1964	IV
	Parental education		X	1960	IV
	Social class	x		2001	II
	Educational level	x		2001	II
	Employment status	x		2001	II
Family conditions	Mother's marital status	x		1950-1956	II
	Number of siblings	x		1962	II
	Marital status	x		2001	II
	Children	x		2001	II
	Family type		X	1964	IV
	Parental mental health problems		X	1953-1965	IV
Scholastic ability	Cognitive ability	x	X	1957-1963/1966	II/IV
	School performance		X	1966	IV
Behavioural problems	Minor psychiatric disorder	x		1964	II
	Truancy		X	1966	IV
	Misconduct in the classroom		X	1966	IV
	Interest in school		X	1966	IV
	Feeling of security at school		X	1966	IV
Health behaviours	Smoking	x		2001	II
	Alcohol consumption	x		2001	II
Social support	Social support	x		2001	II

The SMS cohort was defined as all individuals born in 1953 and living in the Stockholm metropolitan area in 1963 (15,117). The metropolitan area included Stockholm city and those surrounding suburban municipalities (and in some cases, the 'outer suburban zone') that had more than 50 % agglomerated population, less than one-third of the population in agriculture and more than 15 % of the economically active population commuting to the Stockholm city. The population of this area was 1,130,000 in 1960. The area was chosen to reduce the cohort's geographical mobility to a minimum. It was therefore decided that Stockholm, the biggest metropolitan area in Sweden and with the country's presumably highest centrality, would be the optimal candidate. It should also be mentioned that similar projects were discussed in Denmark (Copenhagen), Finland (Helsinki) and Norway (Oslo) within the collaborative framework of the Scandinavian 'Project Metropolitan'. However, only Sweden and Denmark came to proceed with their data collection (Janson, 1975).

The SMS includes three survey studies which constitute the 'backbone' of the material. One of these, the School Study from 1966, is of central importance for the present thesis since it included the sociometric questions used to calculate measures of peer status and social isolation. At the time of the School Study, 288 individuals had left the population, five had died, 1,353 were absent and others had moved out of the Metropolitan area (Stütz, 1985). Consequently, a total of 13,476 individuals participated. The attrition was slightly higher among lower social classes. Information on behavioural problems and cognitive ability was additionally derived from the School Study. All school classes in the Stockholm metropolitan area, with some exceptions of classes with cognitive disabled children, were included in the School Study. The sociometric information is thus based on the complete sociometric mappings of all school classes. However, the information was only registered for cohort members. It is reasonable to assume that the attrition is also somewhat negatively selected in terms of health, school performance and peer relations.

The SMS also contains several registries from which various types of childhood information was collected. Data on family conditions and socioeconomic status was derived from the 1960 Census, the Register of Population and Income (1964), occupational data (1963) and the Dependency and Child Welfare Committee (1953-1965). Aspects of scholastic ability were gathered from local records of marks and applications to upper secondary school. Information about adult health was derived from the Swedish Hospital Discharge Register which includes data about all discharges from Swedish hospitals (overnight patients). The diagnoses contained in these records are primarily based on the judgement of the doctor (Ringbäck Weitoft & Rosén, 2005). In-patient data were available for the period 1969-1983 but because of problems with coverage, the period 1969-1972 was not used.

The SMS data was de-identified in 1986. In 2004-2005, the data was linked by a probability matching to the WMD, which is a temporary, population-based and anonymous database. The WMD contains registry-based information about, for example, education, income, employment, death, sickness and housing. Among these registries, the Swedish Hospital Discharge Register contained information on in-patient care between 1981 and 2003. Thus, through the probability matching of the SMS and the WMD, hospitalisation data was available for a period of 30 years (1973 to 2003). Of the original 15,117 individuals in the SMS cohort, approximately 14,294 individuals (95%) were positively matched and thus included in the SBC (Stenberg, Vågerö, Österman, Arvidsson, von Otter, and Janson 2006).

## 4.2 Measurements

Table 2 gives an overview, by data material and year, of the variables used in the studies upon which this thesis is based.

### *The school class*

Sociometric questions were used to measure aspects of school life. For all questions, the individuals were asked to nominate three classmates.

In Study I, the sociometric information was obtained by the question: "Which boy or girl in this class do you like best?" ('like best'). Here, three aggregated measures of class network structure were calculated in Study I: centralisation, degree of reciprocity, and proportion of isolates. Study II contained the same sociometric question and used reciprocated nominations for 'like best' as an indicator of friendship. Study III focused on peer status, which was derived from the question: "Whom do you best like working with in class?" ('work partner'). The more nominations an individual received for 'work partner', the higher his or her peer status. Study IV included two types of social isolation (marginalisation and friendlessness) in the classroom. An individual was considered to be marginalised if he or she did not receive any nomination for 'work partner'. The lack of any received nominations for: "Who are your three best friends in the school class?" ('best friend') was used as an indicator of friendlessness.

### *Health*

Study I included minor psychiatric disorder in childhood and self-rated health in adulthood, whereas Study II focused only on the latter. Study III and Study IV examined both disease-specific and overall in-patient care. For a distribution of the health measures, see Table 3.

Table 3. Distribution of the health outcomes in the two cohorts.

	n	%
<b>Minor psychiatric disorder (Aberdeen cohort)</b>		
No	12829	92.1
Yes	1104	7.9
<b>Self-rated health (Aberdeen cohort)</b>		
Excellent	1828	26.5
Good	3684	53.5
Fair	1033	15.0
Poor	341	5.0
Good or excellent	5512	80.0
Less than good	1374	20.0
<b>In-patient care (Stockholm cohort)</b>		
No	6279	41.5
Yes	8838	58.5
Infectious and parasitic diseases	1006	6.7
Neoplasms	1239	8.2
Malignant neoplasms	456	3.0
Diseases of the blood(-forming organs) immunological disorders	125	0.8
Endocrine, nutritional and metabolic diseases	401	2.7
Diabetes mellitus	162	1.1
Mental and behavioural disorders	1381	9.1
Alcohol abuse (including alcoholic psychosis)	459	3.0
Drug dependence, toxicomania	432	2.9
Diseases of the nervous system and the sense organs	716	4.7
Diseases of the circulatory system	587	3.9
Ischaemic heart diseases	152	1.0
Other heart diseases	237	1.6
Cerebrovascular diseases	149	1.0
Diseases of the respiratory system	1284	8.5
Pneumonia	298	2.0
Diseases of the digestive system	2095	13.9
Diseases of the skin and subcutaneous tissue	428	2.8
Diseases of the musculoskeletal system/connective tissue	1210	8.0
Diseases of the genitourinary system	2022	13.4
Diseases of kidney and ureter	337	2.2
Symptoms, signs, abnormal findings, ill-def. causes	2365	15.6
External causes of injury and poisoning	2169	15.6
Accidents	1934	12.8
Transport accidents	994	6.6
Accidental poisoning	323	2.1
Suicide and intentional self-harm	232	1.5
Events of undetermined intent	327	2.2

Information about minor psychiatric disorder was derived from the Rutter Scale. This scale was developed to screen for psychological disturbances in children aged 7-13. In the ACDS, a teacher questionnaire (Rutter B2 Scale) was used to detect and evaluate behaviour occurring at school (Rutter, 1967). The scale consists of 26 statements about possible symptoms, with each answer rendering 0-2 points depending on how well the statement applies to the child in question (Batty, et al., 2004). The items are: restless, truants, fidgety, destructive, fights, not liked, worried, solitary, irritable, miserable, twitches, sucks thumb, bites nails, absent for trivial reasons, disobedient, poor concentration, fearful, fussy, lies, steals, wets self, complains of aches, tears at school, stutters, speech difficulty, bullies. Two behavioural dimensions of the scale were initially distinguished by Rutter (1967): neurotic and antisocial. In later literature, researchers have also distinguished a third dimension: hyperactive behaviour (see e.g. Moilanen, Almqvist, Piha, Räsänen, & Tamminen, 1988). In Study I, the complete scale was used. Two of the items (not liked and solitary) were, however, excluded since they are obviously correlated with the sociometric question. In accordance with recommendations (see Rutter, 1965), individuals who reached a total score of 9 or more were classified as having a minor psychiatric disorder.

Self-rated health in adulthood was measured through the question: “*Over the last 12 months would you say that your health on the whole has been – (1) excellent, (2) good, (3) fair, (4) poor?*” In Study I, a dichotomous measure was used (distinguishing between those who reported good self-rated health and those who reported that they experienced less than good self-rated health). This dichotomisation is widely recognized (see e.g. Burström & Fredlund, 2001; Kennedy, Kawachi, Glass, & Prothrow-Stith, 1998; Östberg & Modin, 2007). In Study II, however, all four response options were analysed as an ordinal scale in order to take full advantage of the available information.

Information on in-patient care was derived from the Swedish Hospital Discharge Register for the years 1973-2003. This register contains data on all in-patient care events from Swedish hospitals (overnight patients). The diagnoses are primarily based on the judgement of the doctor (Ringbäck Weitoft & Rosén, 2005) and were classified using the 8th Revision (1973-1986), the 9th Revision (1987-1996) and the 10th Revision (1997-2003) of the International Classification of Diseases (ICD). In Study III and Study IV, a measure of overall in-patient care was included. Additionally, in Study III, underlying diagnoses were grouped according to the European Shortlist for Causes of Death as established by Eurostat (Spijker, 2004). The shortlist is largely based on the ICD-chapters and includes 65 hierarchically arranged groups, of which 17 constitute first-level groups (i.e. chapters) and the rest second-level groups (Eurostat, 1998). In Study III, 14 first-level groups and 14 second-level groups were included. In Study IV one type of disease-



specific in-patient care was used: mental and behavioural disorders (ICD 10: F00-F99).

### *Additional variables*

Various potential confounding and/or mediating factors were included in the studies, categorised into structural factors, family conditions, scholastic ability, behavioural problems, health behaviours and social support. These variables are further described in the empirical studies.

Gender was taken into consideration in all four studies: the analyses in Study I and Study IV were gender-adjusted, while gender-separated analyses were performed in Study II and Study III.

## 5. The main findings

The four empirical studies included in the present thesis address structural aspects of the school class as a social context and their influence on subsequent health, filling previously identified knowledge gaps. The major findings are summarised below.

### *School class structure influences health in childhood and adulthood*

The results of Study I demonstrated variation between school classes both in terms of minor psychiatric disorder in childhood and self-rated health in adulthood. This study also showed that the overall social network structure of the school class, measured as centralisation, has contextual effects on child and adult health. In other words, individuals who attended highly centralised classes, which were characterised by a more unequal distribution of status positions, had a more negative health development across the life course regardless of their own status position in the school class. This association was not confounded by other structural factors (e.g. absence, proportion of boys, grade). Neither degree of reciprocity nor proportion of isolates was associated with health.

### *Children's friendships have long-term effects on health*

Study II revealed the number of friendships a child had to be additionally associated with self-rated health in adulthood. Among men, this association was explained by socioeconomic status in adulthood. For women, none of the included child and adult circumstances could account for this finding, although individual characteristics in childhood as well as adult circumstances such as socioeconomic status and social support contributed to important parts of the explanation.

### *Peer status is linked to a wide range of health outcomes*

Using data on hospitalisation, Study III demonstrated that a child's position in the structure of social positions was not only linked to psychologically-related in adulthood but also to lifestyle-related diseases such as diabetes, alcohol use, drug dependence and cardiovascular diseases. These findings remained when social class in childhood was taken into account.

### *Different types of isolation have separate influences on health across the life course*

According to the results of Study IV, social isolation in the school class was related to overall in-patient care across the life course. While only marginalisation (the lowest peer status position) was associated with the risk of hospitalisation for disease, both marginalisation and friendlessness were linked to an increased number of subsequent hospitalisations for overall in-patient care and for in-patient care for mental and behavioural disorders. The former results were explained by scholastic ability, whereas the latter associations were unaccounted for by any of the background factors included in the study. Moreover, friendlessness and marginalisation seemed to operate partly independently of one another in their influence on health.

## 5.1 Linking the results to the hypothetical model

The findings of the empirical studies tap into aspects of the hypothetical model that was presented earlier (Figure 5). Below, the results are discussed in relation to this model, with references to the model in brackets.

Where childhood circumstances are concerned [A], neither social position as measured by socioeconomic status (parental social class, income and education) nor social relations in terms of family circumstances (mother's marital status and number of siblings) explained the findings of studies II-IV. The same holds for Study II and Study IV when various behavioural problems (minor psychiatric disorder, truancy, misconduct in the classroom, interest in school and feeling of security at school) were included. Scholastic ability did not seem to be particularly important for the results of Study II (where cognitive ability was adjusted for), while it had good explanatory power in Study IV (which included both cognitive ability and school performance). To sum up, of the childhood circumstances that were investigated, scholastic ability (primarily school performance) emerged as an important confounder (or possible mediator). This is in line with previous research which has indicated a clear relationship between friendships, peer status and school performance (DeRosier, Kupersmidt, & Patterson, 1994; Wentzel, 1991; Wentzel & Caldwell, 1997).

Study I, which focused on the influence of the school class on health, demonstrated contextual effects of network measures on concurrent and subsequent health, thus supporting the notion of the school class as a social network [B]. These findings suggest, in other words, that certain aspects of the school class structure have consequences for the health of individual members that operate over and above the effects of individual characteristics and behaviours. Studies II and III showed that social relations [B1] in terms of friendship quantity and social positions [B2] in terms of peer status have far-reaching effects on health. Moreover, Study IV revealed that isolation [B1, B2] as measured by both relations (friendlessness) and positions

(marginalisation) was important for number of hospitalisations in adulthood.

Although not empirically examined in any of the four studies, the results do not counter-indicate the assumption that the influences of friendship quantity and peer status on health are mediated through various psychosocial mechanisms [D] which have a bearing on the child's subsequent achievements [E] in terms of social relations and social positions. In Study II, the resources linked to social relations, measured as social support, did indeed offer a partial explanation for the association between friendship quantity and adult health among females. Moreover, in Study II, socioeconomic status in adulthood (social class, educational level and employment status) emerged as the most important mediator, especially for men.

Among the health-related pathways [F] examined, the behavioural pathway [F1], measured by smoking and alcohol consumption, emerged as a partial mediator between friendship quantity and self-rated health in Study II. Moreover, the results of Study II, in which socioeconomic status and social support emerged as important explanatory factors, may indicate that the psychological pathway [F2] is important. Children with few or no friendships in the class may have low social positions and poor social relations in adulthood, which could result in low self-esteem and fewer coping resources. As was mentioned earlier, previous research has found that adult women report high levels of stress linked to their social networks, while men's stress is more associated with issues related to their career (Kendler, et al., 2001; Kessler & McLeod, 1984). These findings may help us to interpret the gender differences found in this study. The physiological pathway [F3] was not investigated in any of the studies, but the fact that health-related behaviours in Study II emerged as a mediator may support the significance of this pathway. The health outcomes analysed in Study III, where obesity and diabetes was linked to peer status, also indirectly supports the role of the physiological pathway.

Thus, while it did not prove possible to examine all parts of the hypothetical model, the four empirical studies did make it possible to put several parts of the puzzle together. It is a complicated picture, however, and much more research is required to further disentangle the pathways through which school classes may influence health across the life course.

## 6. Theoretical and methodological considerations

The data materials included in this thesis have several merits. First of all, it was a great advantage to be able to use large-scale data materials because it made it possible to apply advanced statistical methods. Secondly, the cohorts were old enough to analyse their life courses from birth until their fifties. Thirdly, all measurements of school class structure were based on sociometry which enabled an objective assessment to be made. Fourthly, the data materials contained a wealth of information about circumstances in childhood and adulthood, such as socioeconomic status, family composition, individual characteristics, health-related behaviours and social support. Thus, potential confounding and mediation could be explored. There are, however, some methodological limitations of the studies as well as a more general critique that should be addressed.

### 6.1 School class networks

While sociometry is an excellent tool for determining network structures, a number of issues need to be examined. The following section addresses some specific questions about the sociometry applied in the four empirical studies and some more general concerns.

#### *Comparisons between the sociometric measures*

The distribution of nominations from the sociometric test (note: based on the full samples) are presented in Figures 6a-c. As can be seen, the distributions are highly similar, in particular 'like best' and 'work partner'. What could be the reason for this, and what are the implications?

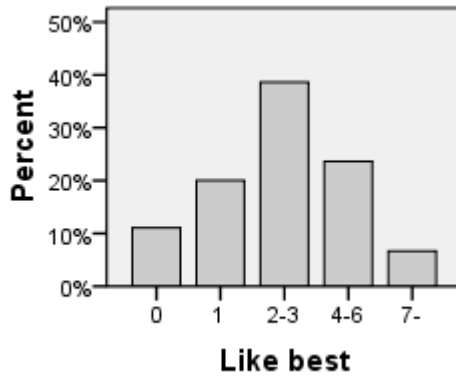


Figure 6a. Distribution of 'like best' nominations, in Aberdeen 1964 (n=13,945).

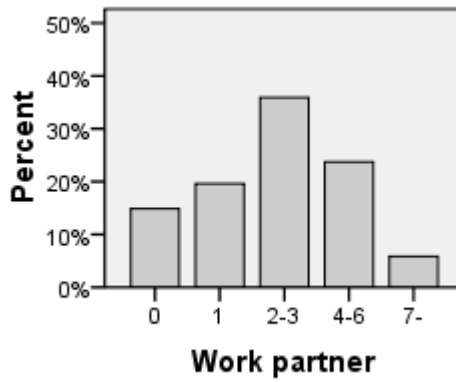


Figure 6b. Distribution of 'work partner' nominations, in Stockholm 1966 (n=13,193).

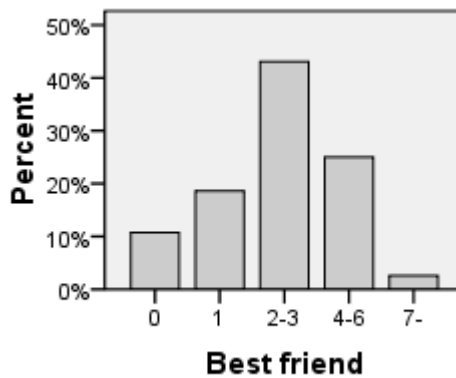


Figure 6c. Distribution of 'best friend' nominations, in Stockholm 1966 (n=13,201).

For a start, there is an evident mathematical explanation: the children were asked to name three classmates. This resulted in a mean value close to three (it is somewhat lower in practice, due to some children being absent on the day of the data collection) regardless of how the question was phrased. Theoretical support for this finding is provided by Stütz (1985), who regards a sociometric nomination as a rational act on the part of the nominator: it is a decision based on the observed qualities of the peers as well as the type of sociometric question asked (see Figure 7). In all social networks, including the school class, it may be assumed that there are norms and values which determine the qualities a peer should have in order to be nominated. In the eyes of the nominator, peers possess, to varying degrees, certain qualities which make them more or less desirable in a given situation or activity. For example, they may have more or less social competence, ambitions or self-esteem, or they may be more or less physically attractive, likable, intelligent or aggressive. Such attributes may be regarded as universal, but the nominator is also likely to take particularistic qualities into consideration. For instance, how the nominator's peers have previously behaved towards the nominator in similar situations may be of importance, as well as how well their interests, behaviours, and attitudes resemble those of the nominator.

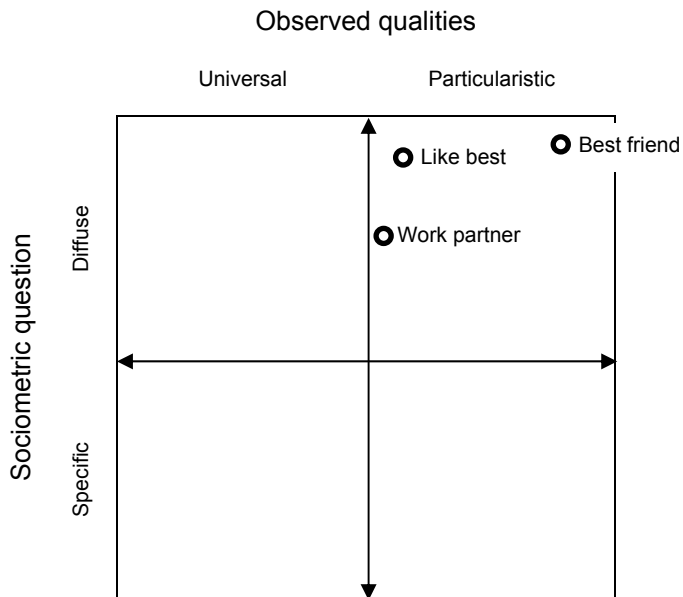


Figure 7. Dimensions of peer nominations. Source: Stütz (1985), modified by author (by inclusion of 'like best').

If the observed qualities of peers constitute the first dimension, the content of the specific sociometric question represents the second

dimension. Along the latter dimension, sociometric questions range from diffuse to specific. While a diffuse sociometric question often includes reciprocity and friendship, and as such also corresponds to the particularistic qualities of the nominee, a specific sociometric question, where the nominator is not assumed to participate in a relationship with the nominee, rather corresponds to the universal qualities of the nominee (Stütz, 1985).

Accordingly, the similarities and dissimilarities between the three sociometric questions used in the present thesis may be recognised by placing them along the dimensions described in Figure 7. In the choice of who the nominator likes best, there is a diffuse element of choice as well as an expected relationship between the nominator and the nominee. Furthermore, the nominator is likely to take into consideration particularistic qualities of the peer in question. Hence, experienced similarity plays an important role. Particularistic qualities are likely to be of even greater importance when it comes to choice of best friend, which also involves a more diffuse element. The work partner aspect may be seen as less diffuse than the previous two questions, since it refers to a more limited range of activities. Here as well, the nominator is assumed to take part in a relationship with the nominee, something which thus highlights the importance of particularistic qualities. At the same time, however, certain universal qualities of the peer, such as punctuality, ambitions, and orderliness, may also add to the basis upon which the nomination of work partner is made (Stütz, 1985).

Thus, although some differences along the diffuse-specific and the universal-particularistic axis do exist, the sociometric questions of 'like best', 'work partner' and 'best friend' seem to capture the similar phenomenon. In the case of 'like best' and 'work partner' this is good because these questions are supposed to capture the same phenomenon (i.e. general acceptance). In other words, when the issue of social positions in focus (as in Study III and Study IV), it should not matter which of these two questions is chosen. Two questions were also used for social relations. In Study II, mutual nominations of 'like best' were used as an indicator of friendship quantity. This procedure has been used elsewhere (Erdley, et al., 2001; Kingery & Erdley, 2007; Parker & Asher, 1993). In Study IV, friendlessness was constructed based on information about 'best friend'. This type of question assumes that the nominations are based on children recognising mutual relationships with specific individuals, whereby it is an explicit measure of friendship (Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006). Some comparisons can be made between these studies. For example, nearly 11 % of the children in Study IV were friendless while the corresponding number in Study II was approximately 18 %. These figures are not entirely comparable, but that could be the result of a difference in severity between 'best friend' and 'like best': it is presumably the case that children have fewer best friendships than relations that are based on mutual liking. Thus, both 'work



partner' and 'like best' seem to measure social position, while 'best friend' and mutual nominations for 'like best' seem to measure social relations. It may be more problematic when considering that the measurements for positions and relations are also quite similar. While some overlap should certainly be expected, the results of Study IV show, nevertheless, that isolation based on the positional versus the relational approach have independent effects on health. Thus, despite the similarities, it is important to recognise the differences.

A final issue is the question upon which the network measures in Study I were constructed. Is it really preferable to use the question 'like best' when capturing social network structures? Indeed, 'like best' does not necessarily capture the 'real' interaction patterns in the school class: children may nominate others they do not actually interact with at all. If that were the case, the sociogram would depict the children's wishes rather than the actual relations between classmates. In that case, it is highly suitable to assess network measures such as centralisation. However, it may be less suitable for measures of degree of reciprocity and proportion of isolates.

### *Stability and change of peer networks*

Given the fact that the data material used in this thesis only involved sociometric assessments at one point in time, the dynamics of the school class structures, in terms of stability (or change), could not be accounted for (see Doreian & Stokman, 1997 for a discussion of the statics and dynamics of social networks). In order to get a sense of how this may affect the results it is necessary to look at previous research.

Stability refers to the extent to which the peer network structure remains intact over time. Several criteria for defining stability have been used in previous studies, something which has resulted in varying stability estimates across studies. Group continuation appears to be fairly stable in a short-term perspective (Cairns, Leung, Buchanan, & Cairns, 1995a; Cohen, 1977; Kindermann, 1993), with much greater fluidity in peer composition apparent in a longer-term perspective (Cairns & Cairns, 1994). The latter may, however, be a function of the transitions between different parts of the school system (e.g. from lower middle school to middle school).

Friendships in childhood and early adolescence seem to be quite stable over time (Bukowski, Newcomb, & Hoza, 1987). There is empirical evidence suggesting that friendship stability increases from first through fourth grade (Epstein, 1986), but remains at the same level from grades four through eleven (Berndt & Hoyle, 1985; Berndt, 1982). Some studies show that friendships characterised by higher quality also seem to be more stable (Bukowski, Hoza, & Boivin, 1994), while other research finds no such differences according to quality (Bowker, 2004). Where peer status is concerned, a meta-analysis by Jiang and Cillessen (2005) demonstrated

moderate to high stability for continuous measures. They conclude that stability is greater for shorter measurement intervals, among older rather than younger children, and among girls rather than boys. Several longitudinal studies have found that characteristics of children's peer interactions are repeated in relationships with romantic partners and friendships in young adulthood (Bagwell, et al., 1998; Eisenberg et al., 2002; Stocker & Richmond, 2007).

### *Other peer contexts*

School, and more specifically the school class, forms a natural boundary for young people's social networks: indeed, most relations occur within the same school (Blythe, Hill, & Thiel, 1982; Coleman, 1961). Nevertheless, there are several other social contexts in which young people interact with peers (Ray, Cohen, & Secrist, 1995). The adverse effects of having few friends or a marginalised position in the school class may be attenuated by being successful with peers outside the classroom and vice versa. Poor relations and a low position in several contexts may have additive or interactive effects on the individual. Studies show, among other things, that in-school peers and out-of-school peers contribute independently to behavioural problems and depression (Kiesner, Poulin, & Nicotra, 2003). Generalising an individual's advantages or disadvantages in one social setting to other settings may thus be misleading (Loomis & Pepinsky, 1948). Young people participate simultaneously in several types of peer networks, of which the school class is only one. However, given the fact that children spend a considerable amount of time in the school class during such a long period of their lives, it is relevant to focus on the school class as a peer context of primary concern.

### *Subjective dimensions of networks*

Sociometry focuses on the objective structure of networks. Nevertheless, there are surely important subjective dimensions of these structures which were not taken into account in the empirical studies. For example, Study I focused on the structural features of school class networks, assuming that these also reflected issues such as social integration and belongingness. Measures of subjective social climate and culture may have had added value to this notion. Moreover, although friendship quantity is a key measure in assessing the impact of friendships on subsequent health, the quality of friendships may act as a moderator. Where peer status is concerned, measures of subjective popularity may have further clarified the differences between sociometric popularity and perceived popularity. A final question concerns the concept of social isolation. The present thesis only applied objective measurements of isolation; it was not possible to establish whether the sociometrically isolated individuals actually felt isolated or excluded in

any way. This type of information could bring about a deeper understanding of how isolation influences the individual and, in turn, his or her future health.

### *Other methods of assessing school class networks*

This thesis has an entirely quantitative focus. Using data materials on cohorts followed from birth to death is, if not essential, at least a major advantage in a life-course perspective. Large-scale studies make it possible to apply a variety of sophisticated statistical methods for calculating confidence intervals, interaction effects and all sorts of differences between categories. Moreover, the very use of sociometry implies the application of quantitative methods, as can be noted in the definition given by Moreno (1934): “*sociometry is the mathematical study of psychological properties of populations, the experimental technique of and the results obtained by application of quantitative methods*” (p.10). Sociometry is, however, not the only way of capturing a social network. Cairns and colleagues (Cairns, et al., 1995a; Cairns, Leung, & Cairns, 1995b; Cairns, Perrin, & Cairns, 1985) have developed an alternative approach, called Social Cognitive Map (SCM), which is based on peer-reports of social groupings. Typically, young people are asked to identify who ‘hang around a lot’. The advantage of SCM over sociometry is that researchers make use of children’s unique and combined knowledge about their social networks. SCM could perhaps, in some cases, provide a substitute or at least an interesting complement to sociometry.

I would not, however, argue that the use of quantitative methods is the only way of approaching school class networks and their importance for health across the life course. On the contrary, although the cohort studies included in the present research provide a wide range of different types of information about classroom networks and the processes that link class structures to subsequent health, the picture that emerges is still an overarching one. In all its ‘objectiveness’, the message of this thesis could well get lost: that we are not talking about observations or nodes, but real people, for whom the structures of the school class have real consequences. If we are truly interested in understanding what brings about these consequences, qualitative methods such as individual interviews, focus groups and observations, may be essential tools. Not only does this force us to confront ‘reality’ but it also gives us the chance to dig deeper into the perspectives of the very individuals and groups of individuals we are examining. Some may argue that life-course research is difficult and time-consuming to conduct even with survey data: how would it be possible to collect qualitative data across the life course? Perhaps, however, it is not a question of replacing survey-based and registry-based information with repeated qualitative studies, but rather of integrating different types of information in one and the same data material. In the best of worlds, the

quantitative data would provide the ‘bones’, while the qualitative data could bring some ‘flesh’ to these bones.

### *Sociometry and ethics*

Ethical permission has been obtained for the use of both the Aberdeen and the Stockholm data. A general discussion about ethics concerning the use of sociometric procedures is nevertheless called for. This debate has been ongoing for a long time in sociometric research and has been revitalised by recent developments in social network analysis (Kadushin, 2005). As previously discussed [3.1.2], the use of negative nominations has been criticised. Another major controversial issue is the fact that the names of both respondents and their contacts are collected, giving the researcher access to potentially harmful information. Here, the privacy of the research subjects must be protected by not revealing the individual identities.

According to ethical guidelines, research subjects must not suffer harm as a result of their participation in a study. This issue is perhaps even more important for research into children and their networks. Research about children differs from research about adults; one major distinction is that the interplay between the adult researcher and the child is characterised by a high degree of inequality. This may affect the degree of voluntariness that children perceive in their participation. Moreover, the sociometric procedure itself may trigger unintended processes in the classroom that may actually influence the social interaction between classmates. However, past research shows that sociometric tests do not have any negative influences of this sort (Bell-Dolan, Foster, & Sikora, 1989; Hayvren & Hymel, 1984).

Another related ethical issue is whether any potential harm outweighs the benefits. In sociometric research into children this means that researchers must evaluate the risk of making children more aware of their own situation and the possible problems this can give rise to in relation to the potential benefits of this research for other children. According to Alderson (2005), participating children seldom gain directly from research; rather it is children in the future who may benefit from research conducted today. This is an important point. There are also other general positive consequences of sociometric research: children are viewed as experts on their own lives and are allowed to report on their own experiences of their social reality, something that is also stated in article 12 of the United Nations Convention on the Rights of the Child. Thus, if the key question is formulated as: “*is the research worth doing?*” (Alderson, 2005, p. 31), the answer here would be: “*absolutely*”.

## 6.2 Measuring health

In all four studies there are two general problems regarding measures of health. The first is the lack of a proper control for health problems at

baseline, resulting in difficulties in interpreting the magnitude of health selection in the analyses (some exception can be made for the two first studies where minor psychiatric disorder was adjusted for in the analysis of self-rated health). The second is that the cohorts were still quite young at the time of the health follow-up, with some diseases and other reasons for ill health not yet being present in the study population. The results may have been somewhat different if the cohorts had been older. Furthermore, each of the three health measures has some limitations. These are examined below.

### *Teacher assessments*

Information about minor psychiatric disorder was used to indicate childhood health. Using it as a health outcome, however, is not entirely straightforward. The scale comprises items tapping into emotional and behavioural problems which, to some extent, are difficult to disentangle from peer problems. The original scale consisted of two items ('not liked' and 'solitary') which were removed in Study I and Study II since they directly reflect peer problems. In other words, directionality may be unclear.

The Rutter B2 scale is based on teacher assessments, which could lead to two potential problems. Firstly, it may cause an overestimation of the variation of minor psychiatric disorder at the school class level. Secondly, teachers' assessments of student behaviours could possibly be biased by the students' success with peers, which may result in an overestimation of the relationship between the sociometric measures and minor psychiatric disorder. These issues should, however, not be exaggerated: the Rutter B2 scale has proved to have satisfactory reliability and good discriminative power (Kresanov, Touminen, Piha, & Almqvist, 1998; Rutter, 1965).

### *Self-ratings*

The two types of outcome for adult health are quite different from one another. The first is self-rated health. The use of self-rated health measures has grown rapidly since the early 1980s when it was discovered that perceived health status predicted mortality better than did medical records (Mossey & Shapiro, 1982). This led researchers to conclude that "*self-ratings provide a simple, direct, and global way of capturing perceptions of health using criteria that are as broad and inclusive as the responding individual chooses to make them*" (Idler & Benyamini, 1997, p. 22). Several studies do indeed show that measures of self-rated health generally have good reliability (Lundberg & Manderbacka, 1996; Martikainen et al., 1999).

### *Registry data*

In-patient care constitutes the second outcome indicating adult health. This information comes from national registries which provide reliable data with good coverage. However, since it only includes events which necessitate

staying at least one night in hospital, the degree of severity of the events is in most cases higher than, for example, out-patient care. In other words, this data would miss individuals with lesser problems that did not require an overnight stay. While this may not discriminate against diseases such as stroke or cancer (which are likely to be acute or require extensive medical treatment), it could be a problem where mental and behavioural disorders are concerned. Moreover, in-patient care data may be biased by differences in help-seeking behaviour. If individuals who have more advantaged positions and close relations throughout life also have access to better information, encouragement and support, it is plausible that these individuals are more likely to seek help.

Another potentially problematic aspect of the in-patient care outcome is the long time period during which the information was gathered. In both studies using in-patient care as an indicator of health, the follow-up period was thirty years. Firstly, types of disease may differ across the life course, with some diseases more common at younger ages and others more frequent in later life. Furthermore, over a period of thirty years most people are likely to end up at the hospital at some point, why this outcome may not be particularly discriminative (but on the other hand, this information rendered the possibility to examine the number of events during this period).

### *Comparisons*

In conclusion, minor psychiatric disorder, self-rated health and in-patient care are obviously very different as health outcomes, particularly in terms of degree of severity. While the first indicates behavioural and emotional problems as assessed by teachers, the second is self-perceived and comprises a global measurement of health status. The third measure is registry-based and indicates a high severity of disease. However, if one assumes that individuals who are disadvantaged in the context of the school class have a general susceptibility towards ill health, these differences may not play a significant role. The notion of general susceptibility is, moreover, supported by the empirical findings in the four studies included in this thesis.

### *Good health?*

This thesis has focused on negative health outcomes through measurements of ill-health and disease. As others have convincingly argued (e.g. Antonovsky, 1996), lack of disease is not the same as good health. Although the studies of the this thesis show that less hierarchical school classes, high friendship quantity, high peer status and not being subjected to social isolation may be interpreted as protective factors against disease, future studies should aim at examining more explicitly which aspects of the school class that could enhance positive health across the life course.

## 6.3 Capturing pathways

The data materials which were used contain rich information about circumstances in childhood and adulthood; this is an obvious strength if one wants to be able to adjust for confounding factors as well as investigate potential pathways through which aspects of the school class influence subsequent health. Nevertheless, it should be acknowledged that the confounders and mediators used here do have limitations.

In Study I it was possible to adjust for several structural aspects of the school class which possibly act as confounders. These included indegree (i.e. peer status) and reciprocity (i.e. friendship quantity) at the individual level as well as grade, absence and gender distribution at the contextual level. Some additional measures could, however, have provided important information. For example, it would have been relevant to include the proportion of across-gender nominations or some information about the teachers.

Where the measures of socioeconomic status are concerned it should be noted that in Study IV information about parental education was only available at the household level. This could result in a misleading use of the term 'parental education' if additional adults (e.g. grandmothers and grandfathers) were living with the child or if the child lived in a reconstituted family. A further issue is the lengthy follow-up time for in-patient care in Study III and Study IV, which made it unfeasible to include information about socioeconomic status in adulthood (since it would overlap).

Another limitation involves the indicators of family conditions. In Study II, the measure of having children in adulthood was very crude (yes/no). It would perhaps have been better to use a continuous measure indicating the number of children. Once again, it was not possible to include adult marital status and the number of children in Study III and Study IV because of overlap with in-patient care data.

Scholastic ability included information on cognitive ability and school performance. For the former, a composite measure of three cognitive subtests was used (spatial, verbal and numerical) in studies II and IV; for the latter, only the average of all marks could be attained in Study IV. For both measures it would have been an advantage to use more detailed information. It would also have been a strength to be able to include school performance in Study II.

With regard to behavioural problems, the measures for internalising problems (feeling of security at school and disinterest in school) and externalising problems (truancy and misconduct) in Study IV could have been better. Ideally one would want to include measures of anxiety, depression and aggression (Bell-Dolan, Foster, & Cristopher, 1995; Gazelle & Ladd, 2003; Hymel, Rubin, Rowden, & LeMare, 1990; Kupersmidt & Coie, 1990). Feelings of discomfort, disinterest in school, truancy and misconduct

can at best be seen as broad indicators of internalising and externalising problems (Asher & Wheeler, 1985; Ladd, 1984).

Two types of health behaviour in adulthood were included in Study II: smoking and alcohol consumption. Indicators for these behaviours in young adulthood were available for a subsample in Study III and Study IV but the sample was unfortunately too small to use. Information about health behaviours in childhood would have benefited the analyses in all four studies.

Finally, Study II included social support as a potential mediator. This type of information would have been highly relevant for Study IV. Information about the structure of personal networks in adulthood (e.g. friends, family and colleagues) along with measures of social support in childhood would have provided important insights in all the empirical studies.

### *Unmeasured pathways*

Drawing upon the hypothetical model presented in the theoretical chapter, there were several important mediators (and possibly also confounders) that could not be taken into account in the empirical studies. Perhaps the most crucial issue are the psychosocial mechanisms that link the different stages in the model. For example, no measures of expectations or ambitions were included in the analyses, although it will be possible to do so in future research using the Stockholm data. Moreover, information about stress or (group) identification would presumably be important in helping to explain the influence of the school class on health across the life course; unfortunately, such data was not available for either of the two data materials. Where the health-related pathways are concerned, some aspects of the behavioural pathway (smoking and alcohol consumption) could be assessed, but it was not possible to include aspects of the psychological (e.g. coping effectiveness and self-esteem) or the physiological pathway (e.g. allostatic load and immune system functioning).

### *Causality and determinism*

The outline of this thesis raises two important issues: causality and determinism. The first question concerns the difficulty of disentangling the 'social causation' hypothesis and the 'social selection' hypothesis. In research into social inequalities in health, this issue refers to whether disadvantaged social conditions contribute to ill health or whether unhealthy individuals become socially disadvantaged (Chandola, Bartley, Sacker, Jenkinson, & Marmot, 2003; Marmot, Ryff, Bumpass, Shipley, & Marks, 1997). This notion is certainly applicable to the longitudinal study of school class influences on health: do children who have few social relations with classmates and low social positions in the classroom become ill, or is it because these children are unhealthy that they are disadvantaged in the



social context of the school class? The present thesis focuses on the influence of the school class on health rather than vice versa. This is a highly plausible approach, given the longitudinal design of the empirical studies. However, this is not claimed to be the entire truth: in reality, it is most likely a case of mutual influences between social conditions and health development at each phase of the life course.

Given the focus on social structures in the present thesis, another greatly debated issue, determinism, must be addressed. Certainly, it is true that a network perspective involves a structuralist approach (Cook & Whitmeyer, 1992) as opposed to an individualistic approach, but while the present thesis assumes that social interaction is structured, it is never seen as deterministic. Individuals may be constrained or enabled by the social structures in which they participate, but these structures are themselves shaped by the social interaction between members of the network. It should also be emphasised that most individuals are healthy, in childhood and adulthood alike. Hence, a disadvantaged situation in the school class is by no means a 'perfect' predictor of adult outcomes, nor is it the only aspect of childhood that influences subsequent health.

### *The issue of gender*

A vast amount of studies of networks, relations and positions in childhood and of social inequalities in health have identified gender differences. Although I have not focused on gender in this introduction, it was not disregarded in the empirical studies. In Study I, gender at the individual level and the gender distribution at the contextual level were both taken into account. The analysis showed, firstly, that females had a lower risk of minor psychiatric disorder than males, while they had a higher risk of rating their health in adulthood as less than good (data not presented in Study I). Secondly, no association between gender distribution at the school class level and either of the two health outcomes was found. The gender difference in adult self-rated health was replicated in Study II. The association between friendship quantity and self-rated health was not moderated by gender. However, since the mechanisms linking friendship quantity to self-rated health differed according to gender, the decision was made to analyse males and females separately. In Study III, the distribution of peer status did not differ according to gender (a similar result has been shown in Östberg, 2003). Nevertheless, gender-separated analyses were performed because of gender differences in the prevalence of some types of disease. The analysis also revealed some differences in the magnitude of the association between peer status and disease-specific outcomes. In-patient care was more common among women but there were no differences between males and females when the association between peer status and overall in-patient care was examined. Study IV demonstrated some gender differences in the

prevalence of social isolation (males were more likely to be friendless). Additionally, in-patient care overall was much more common among women than men, whereas no gender differences were found for in-patient care for mental and behavioural disorders.

In conclusion, gender differences were found for some of the measures of structural conditions in the school class as well as for most of the health outcomes. Nevertheless, gender did not seem to moderate the 'crude' associations between school class structure and subsequent health. It is reasonable, nevertheless, to imagine that the pathways through which school class structures influence health across the life course generally differ between males and females, as was shown in Study II. Such differences could potentially be more pronounced when other pathways are taken into consideration (for example, stress).

## 6.4 'Real' life-course studies

A major limitation of the present thesis is that it included a measurement of sociometry at only one point in time; a 'snap-shot' of the school class network. This made it impossible to evaluate the change and stability of the class network structure and is an important issue to take into consideration when designing future data collections.

A related issue involves the measurement of health. The adult health outcomes in this thesis included self-rated health at ages 45-52 and in-patient care at ages 20-50. For the former, health was thus self-reported and only measured at one time-point, while for the latter, annual and detailed measurements were available but set a high lower limit for the degree of severity. Future studies would, ideally, include repeated measurements of both self-rated and 'objective' health at several points in time from early childhood to old age.

Using data materials that contain a wealth of information from childhood and adulthood, but not much in between, is a problem which will logically emerge when birth cohorts are revitalised by late follow-ups. Although having longitudinal data materials that facilitate a life-course approach is a luxury, 'in-between' data is required for us to be able to draw more informed conclusions. This is especially important for anyone who is interested in examining the mechanisms that link school class structures to health across the life-course. To examine stress, for example, it is important to include data that are not only survey- or registry-based but also collected in other ways, such as qualitative interviews (e.g. life history or narrative approaches) or medical examinations (measuring stress through, for example, cortisol levels).

## 6.5 Relevance for young people of today

The results of this thesis are based on two cohorts who were born in the mid-20th century and followed up until the beginning of the 21st century. To some extent the data are 'historical': what can the structures of school classes in the 1960s really tell us about conditions in the classrooms of today? While trends in didactics and educational system reforms may have altered the preconditions of school classes, there is little reason to assume that the structures of school classes have become significantly different over time, or that the importance of the school class as a social context has changed. It is, however, possible that the technological developments of recent decades, such as text messaging, online communities and instant messaging (Oksman & Turtiainen, 2004), may have provided additional arenas for social interaction among young people. Hypothetically, this progress could favour those who already enjoy many friendships and high status positions by increasing the channels for social support, information and influence (cf. Mikami, Szwedo, Allen, Evans, & Hare, 2010). These developments could thus further differentiate between children who are advantaged and disadvantaged in the classroom, thereby possibly causing more pronounced differences in health in a longer-term perspective. On the other hand, alternative social arenas could potentially compensate for adversities in the school class (cf. Notley, 2009). More research is needed to verify any of these notions.

## 7. Concluding discussion

The present thesis has identified a number of structural conditions of the school class as relevant for health across the life course. Moreover, different parts of the pathways linking the school class to subsequent health could be examined. The question is: can this new knowledge add to the ongoing debate about the social determinants of health?

Some may argue that the school class is a peripheral social determinant which can never compete with the study of other structural conditions in childhood such as socioeconomic conditions, family matters or education. However, while the school class may seem to be a less significant sociological entity than other social contexts, one has to remember that young people spend many years together with their classmates during a period that is characterised by enormous change. It is thus reasonable to assume that the structural conditions of the school class and the experiences in these structures leave an important mark on the child – a notion which is supported by the findings of the present thesis.

The question that remains is what the practical implications of these results may be. In the early 1940s, Jennings (1941, p. 512) described sociometry as: *“an axis with two poles. The arm toward one pole is directed toward the discovery of the deeper levels of society’s structure. The other is directed toward promoting change of society based upon the dynamic facts found in its structure”*. While this thesis is not about health promotion or intervention programmes it is difficult to conduct research into health disparities without at least having an underlying ambition to reduce these disparities. Below, I present a brief discussion of the policy implications arising from my findings.

### 7.1 The need for a social curriculum?

For a long time we seemed to have forgotten that children not only work when at school but are also busy interacting with each another. In other words, while school is about learning, it is also a place where children learn about social matters such as making friends and handling conflicts. As has been shown in educational research, children have differing cognitive abilities and differing potential to profit from education. Should the same logic not apply to the ability to interact with others? To assume that the structures of the school class are ‘natural’ and, as such, not worth trying to

improve, is similar to saying that children with learning difficulties must manage on their own. Children need to feel connected to their teachers and peers and they need to feel competent, both academically and socially (Herman, Reinke, Parkin, Traylor, & Agarwal, 2009).

### *Anti-bullying programs*

In recent decades, several school-based intervention programmes targeted at bullying have been initiated and implemented; these include 'Friendly schools', 'Steps to Respect', 'Bully-Proofing Your School', 'SAVE' and 'Olweus Bullying Prevention Programme'. In a recent systematic review by Farrington and Ttofi (2009) it was concluded that such programmes have been effective in reducing bullying in schools all over the world.

Bullying is one of the most detrimental consequences of negative social interaction. Although the present thesis does not disagree with this notion, it demonstrates that school class networks are not simply about bullying. The picture is actually much more complex. Children in the lowest status positions are not alone in experiencing worse health later in life; there is in fact a gradient in health by peer status. Similarly, it is not only children who are friendless who rate their health as worse in adulthood; this is also the case for children with few friends. Perhaps even more important, a wide status distribution in the school class seems to influence all children regardless of their own peer status.

It is not the intention here to pass any judgment on anti-bullying programmes as such. The point to be made is, rather, that these programmes actually target the climate and integration in the overall school class context in their aim to reduce bullying. This is reflected in a recent evaluation of school-based anti-bullying programmes by The Swedish National Agency for Education (2011). Although no programme was evaluated as a whole, the report highlighted some specific features of anti-bullying strategies that seemed to reduce bullying. Firstly, successful schools had a systematic way of approaching these issues. Secondly, it was important to have a 'whole school approach' where everyone in the school helped in the task of reducing bullying and, thirdly, a positive school climate was a precondition for success. Lastly, schools where students felt that they were involved and could influence school activities had a better social climate and less bullying.

Thus, given the fact that school-based interventions against bullying involve several aspects linked to the wider school and school class context, I strongly suggest that the rhetoric should also move towards a more explicit focus on the overarching structures and climate of the school class. Although bullying is important, it should not be the only social condition of interest: the school class network affects all its members, from top to bottom and from those with many friends to those without friends. By applying this broader perspective, a variety of classroom-related circumstances could be

targeted for interventions (e.g. friendlessness and inequality in status distribution), thus making even better use of already existing school-based intervention programmes.

Although the role of the teacher has not been mentioned so far in this thesis, it is surely something that needs to be addressed when discussing intervention strategies. Teachers are not just subject matter specialists, they “...*deliberately or unwittingly guide and direct the development of group processes in the classroom*” (Schmuck & Schmuck, 1975, p. 169) by creating norms and rules for the social behaviour of students in the classroom and by giving messages regarding the students’ interactions with their classmates (Ryan & Patrick, 2001). Thus, the class teacher has a major opportunity to influence the school class context by reinforcing pro-social behaviour, encouraging cooperative behaviour and modelling positive social interactions (Murberg & Bru, 2004). While most teachers are likely to be aware of this, they are, at the same time, already greatly burdened by the curriculum and the academic goals set by the school. Here, the responsibility lies with policy makers to make sure that the social issues of the school are added to the agenda and with schools to ensure that the necessary resources are also acquired.

### *Some final remarks*

To return to the quote by Jennings (p. 64), this thesis does not provide any solutions for improving the social conditions of the school class. It does, however, certainly reveal the importance of acknowledging the school as a social arena that matters for health development. Although other social contexts (i.e. school, family and neighbourhood) may be as important, or even more important, for children’s future life chances, one factor supports the importance of carrying out research on the school class: it is namely a social unit with well-defined boundaries, in a geographically confined area, where children are more or less forced to interact with one another while supervised by adults. Consequently, it is the perfect setting for prevention and intervention. Given the fact that programmes against bullying seem effective, perhaps the idea of taking these programmes one step further and fully integrating them with the traditional curriculum, is not that far-fetched. This approach has indeed already been undertaken in some schools.

In his recent article, Laursen (2010, p. 901) wrote: “*We know more about the peer context than ever, but we have also learned that the topic is far more complex than we previously thought.*” Thus, the complexity of the school class network remains to be further explored, as does its impact on children’s lives. Nevertheless, the present thesis can hopefully help to expand the notion of a ‘class of origin’ and to build a knowledge base for improving not only children’s health but also their ‘adult destinations’.

# Acknowledgements

Writing a thesis is far from a ‘one (wo)man show’. That I actually succeeded with this task was a fortunate combination of being at the right place, at the right time and surrounded by the right people.

I would especially like to thank the following persons within the academia: Maria Rosaria Galanti for introducing me to my supervisor to be; Per Carlson, my exceptionally pedagogical teacher in quantitative methods, for recommending me; Denny Vågerö for employing me to do work on the Stockholm Birth Cohort Study; Reidar Österman for teaching me time-saving syntaxes and helping out with technical issues; the administrative genius Cathrin Wiksell for always giving me a hand when I needed one; Lisa Björk for sharing good times and laughs; Marie Väfors Fritz for all the stress-reducing coca-cola breaks; Bitte Modin for being my ‘extra mother’ and mentor; Judith Black for making my English readable; Olle Lundberg for letting me whine about silly problems; Monica Åberg Yngwe for entrusting me with teaching responsibilities at the master’s programme, Jenny Torssander for lending me her room during our exchange; Lisa Folkesson and Sara Brolin Låftman for watching my back out on the field; as well as Fredrik Petersson and Kristiina Rajaleid for being such good roommates.

I have really enjoyed working at CHESS. In fact, I cannot even imagine a better learning environment. The corridor at Sveaplan has also served as a quasi-experimental social setting analogous to the school class. It has given me great satisfaction to see how social relations have been created, positions negotiated and the social climate debated. We have had a lot of fun: re-writing lyrics to defence parties; making waffles and ‘mini semlor’ together in the kitchen; celebrating Easter and Christmas with coffee and cakes. Sincere thanks to all my colleagues at CHESS, both past and present, for inspiration, guidance and good times.

During my years as a doctoral student, I have also had the advantage to be a part of different constellations both inside and outside of CHESS. The postgraduate programme at CHESS has, besides being an informal network which has provided a lot of fun activities, provided great opportunities to develop and learn. One great example of this is the doctoral student workshops with Finnish and Danish colleagues: those workshops have been the absolutely best thing about being a doctoral student at CHESS. It has been a privilege to be able to participate at these occasions and I wish to thank all participants for sharing their thoughts and comments. The last two

years, I have been a member of the doctoral student council at Department of Sociology. It has been really interesting and thanks to my colleagues in the council it has also been great fun. During one semester, I had the opportunity to work at the Swedish Institute for Social Research (SOFI). I am thankful for colleagues in both the LNU group and the social policy group taking such good care of me. Finally, I wish to thank the research group at CHES which I have been a member of during my doctoral studies. It has contributed to both academic and personal growth to be included in this group of very dedicated and excellent child researchers: Viveca Östberg, Bitte Modin, Anders Hjern, Petra Lindfors, Sara Brodin Låftman and Lisa Folkesson. You are my source of inspiration.

Of course, my supervisors Viveca Östberg and Michael Gähler deserve special credits. I guess that sometimes I have been like a difficult teenager: obstinate and impatient. It is almost impossible to count all the times that I have extracted or added studies to the thesis. However, to paraphrase Mark Twain, my supervisors had a great deal of trouble with me, but I think they enjoyed it. Also, I reckon that you can see it as good practice for when your kids become teens. Our meetings, which often could get ridiculously long (but often fun), sometimes left me with mixed feelings: how much more work do I really need to put into this useless paper; is not everything related to everything anyway and impossible to disentangle; and should I change my career to become a florist or something? On the other hand, no others could bring me such motivation and feeling of progress as my supervisors did. They have unselfishly and generously shared their expertise, advices and thoughts with me, and read numerous drafts, texts and e-mails. I owe you a lot, to say the least.

In the words of Elisabeth Foley: the most beautiful discovery true friends make is that they can grow separately without growing apart. During the years, I have gained this kind of friendship with some extraordinary persons. I went to the same school class as Ida at the upper level of compulsory school and almost fifteen years later, we are still good friends. In upper secondary school, Malin and I made acquaintance, and I treasure her friendship highly. Somewhere in the southern parts of Sweden I ran into the lovely Johanna and, guided by our similar experiences, we became very close. My friends have always wondered exactly what I do. Am I a social worker; do I write books; and will I eventually become a nutty professor? I guess it is my own fault that I have not explained it that well. But since they are such good friends, they have accepted that I do something interesting and important and have supported me; even felt a bit proud. I truly appreciate that.

I think that it is in its right place to thank my ex-husband for giving me the space and encouragement I needed to follow my dreams. After the divorce, I seriously doubted that I would ever find love again. Then someone told me that “there are plenty more fish in the sea”. It turned out that he was actually the fish himself. With him, a ‘little fish’ came along with the deal



and, before even realising it, I had become a step-mother to the sweetest little boy. Best deal I ever made. These unexpected developments turned my priorities completely up-side-down and introduced a brand new type of exhaustion (suddenly, I had morphed into some kind of ‘småbarnsförälder’) but I am truly loving every minute of it. Thank you both for including me in your family: you make everything worth wild.

Finally, there are two persons that I would like to thank in particular. The first is my father. To him, I owe a large part of my identity, not the least music-wise and academic-wise. He was the first one who told me that sociology was ‘the shit’ and he was also the one who introduced me to the great legends of rock ‘n roll. I will always keep with me the image of the little girl and her father who drove with the convertible roof down and listened to “Strawberry fields forever”, with the early autumn leaves swirling around. Dad, I wish that you were still here with us. The second is my mother. I do not know what I have done to deserve such an incredibly supportive mother. It is impossible to describe in words how grateful I am for her unconditional love. Mum, thank you for having such strong faith in me, even at times when I had none; I dedicate this thesis to you.

Ylva Almquist  
Stockholm, 2011-03-18

Financial support: Centre for Health Equity Studies and the Swedish Council for Working Life and Social Research (no. 2006-1637).

# References

- Abel, T. (1991). Measuring Health Lifestyles in a Comparative Analysis: theoretical Issues and empirical Findings. *Social Science and Medicine*, 32, 899-908.
- About, F. E., & Mendelson, M. J. (1996). Determinants of friendship selection and quality: developmental changes. In W. M. Bukowski, A. F. Newcomb & W. W. Hartup (Eds.), *The company they keep: friendship in childhood and adolescence*. Cambridge: Cambridge University Press.
- Adler, P. A., & Adler, P. (1998). *Peer power: Preadolescent culture and identity*. New Brunswick, NJ: Rutgers University Press.
- Adler, P. A., Kless, S. J., & Adler, P. (1992). Socialization to gender roles: Popularity among elementary school boys and girls. *Sociology of Education*, 65(3), 169-187.
- Allan, G. (1998). Friendship, sociology and social structure. *Journal of Social and Personal Relationships*, 15, 685-702.
- Allen, J. P., Porter, M. R., & McFarland, F. (2006). Leaders and followers in adolescent close friendships: susceptibility to peer influence as a predictor of risky behavior, friendship instability, and depression. *Development and Psychopathology*, 18, 155-172.
- Almqvist, Y., Modin, B., & Östberg, V. (2010). Childhood social status in society and school: Implications for the transition to higher levels of education. *British Journal of Sociology of Education*, 31(1), 31-46.
- Anant, S. S. (1966). The need to belong. *Cunoda's Mental Health*, 14, 12-21.
- Aneshensel, C. S. (1992). Social stress: theory and research. *Annual Review of Sociology*, 18, 15-38.
- Antonovsky, A. (1996). The salutogenic model as a theory to guide health promotion. *Health Promotion International*, 11(1), 11-18.
- Armentrout, J. A. (1972). Sociometric classroom popularity and children's reports of parental childrearing behaviors. *Psychological reports*, 30, 261-262.
- Asher, S. R. (1983). Social competence and peer status: recent advances and further directions. *Child Development*, 54, 1427-1434.
- Asher, S. R., & Dodge, K. A. (1986). Identifying children who are rejected by their peers. *Developmental Psychology*, 22(4), 444-449.
- Asher, S. R., Parker, J. G., & Walker, D. L. (1996). Distinguishing friendship from acceptance: Implications for intervention and assessment. . . In W. M. Bukowski, A. F. Newcomb & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence*. New York: Cambridge University Press.

- Asher, S. R., & Wheeler, V. A. (1985). Children's loneliness: A comparison of rejected and neglected peer status. *Journal of Clinical and Consulting Psychology, 53*, 591-596.
- Bagwell, C. L., Coie, J. D., Terry, R. A., & Lochman, J. E. (2000). Peer clique participation in middle childhood: Associations with sociometric status and gender. *Merrill-Palmer Quarterly, 46*, 280-305.
- Bagwell, C. L., Newcomb, A. F., & Bukowski, W. M. (1998). Preadolescent friendship and peer rejection as predictors of adult adjustment. *Child Development, 69*(1), 140-153.
- Bagwell, C. L., Schmidt, M. E., Newcomb, A. F., & Bukowski, W. M. (2001). Friendship and peer rejection as predictors of adult adjustment. *New Directions for Child and Adolescent Development, 91*, 25-49.
- Ballantyne, P. J. (1999). The social determinants of health: a contribution to the analysis of gender differences in health and illness. *Scandinavian Journal of Public Health, 27*, 290-295.
- Barry, C. M., & Wentzel, K. R. (2006). Friend influence on prosocial behavior: the role of motivational factors and friendship characteristics. *Developmental Psychology, 42*, 153-163.
- Bartley, M., Blane, D., & Montgomery, S. (1997). Socioeconomic determinants of health: health and the life course: why safety nets matter. *BMJ, 314*(1194-).
- Batty, G. D., Morton, S. M. B., Campbell, D., Clark, H., Davey Smith, G., Hall, M., & Leon, D. A. (2004). The Aberdeen Children of the 1950s cohort study: Background, methods and follow-up information on a new resource for the study of life course and intergenerational influences on health. *Paediatric and Perinatal Epidemiology, 18*, 221-239.
- Bearman, P. S., & Moody, J. (2004). Suicide and friendships among American adolescents. *American Journal of Public Health, 94*(1), 89-95.
- Bell-Dolan, D. J., Foster, S. L., & Christopher, J. S. (1995). Girl's peer relations and internalizing problems: Are socially neglected, rejected, and withdrawn girls at risk? *Journal of Clinical Child Psychology, 24*(4), 463-473.
- Bell-Dolan, D. J., Foster, S. L., & Sikora, D. M. (1989). Effect of sociometric testing on children's behavior and loneliness in school. *Developmental Psychology, 25*(2), 306-311.
- Belle, D. (1989). Gender differences in children's social networks and supports. In D. Belle (Ed.), *Children's social networks and social supports*: John Wiley.
- Benenson, J., Apostoleris, N., & Parnass, j. (1998). The organization of children's same-sex peer relationships. *New Directions for Child and Adolescent Development, 81*, 5-23.
- Berdnt, T. J., & Hoyle, S. G. (1985). Stability and change in childhood and adolescent friendships. *Developmental Psychology, 21*(6), 1007-1015.

- Berkman, L. F., & Glass, T. (2000). Social integration, social networks, social support, and health. In L. Berkman & I. Kawachi (Eds.), *Social Epidemiology* (pp. 137-173). New York: Oxford University Press.
- Berkman, L. F., Glass, T., Brissette, I., & Seeman, T. E. (2000). From social integration to health: Durkheim in the new millennium. *Social Science & Medicine*, *51*, 843-857.
- Berkman, L. F., & Kawachi, I. (2000). *Social epidemiology*. New York: Oxford University Press.
- Berndt, T. J. (1982). The features and effects of friendship in early adolescence. *Child Development*, *53*, 1447-1460.
- Berndt, T. J. (1996). Friendship quality affects adolescents' self-esteem and social behavior. In W. M. Bukowski, A. F. Newcomb & W. W. Hartup (Eds.), *The company they keep: Friendship during childhood and adolescence* (pp. 346-365). New York: Cambridge University Press.
- Berndt, T. J., Hawkins, J. A., & Jiao, Z. (1999). Influences of friends and friendships on adjustment to junior high school. *Merrill-Palmer Quarterly*, *45*, 13-41.
- Berntsson, L. T., & Gustafsson, J.-E. (2000). Determinants of psychosomatic complaints in Swedish schoolchildren aged seven to twelve years. *Scandinavian Journal of Public Health*, *28*(4), 283-293.
- Bjerstedt, Å. (1955). Sociometric relations in elementary school classes. *Sociometry*, *18*, 147-152.
- Blane, D. (1985). An assessment of the Black Report's explanations of health inequalities. *Sociology of Health & Illness*, *7*, 423-445.
- Blane, D., Bartley, M., & Davey Smith, G. (1997). Disease etiology and materialist explanations of socioeconomic mortality differentials. *European Journal of Public Health*, *7*(4), 385-391.
- Blane, D., Hart, C. L., Davey Smith, G., Gillis, C. R., Hole, D. J., & Hawthorne, V. M. (1996). Association of cardiovascular disease risk factors with socioeconomic position during childhood and during adulthood. *BMJ*, *313*, 1434-1438.
- Blau, P. M. (1977). A macrosociological theory of social structure. *The American Journal of Sociology*, *83*(1), 26-54.
- Blythe, D. A., Hill, J. P., & Thiel, K. S. (1982). Early adolescent's significant others: grade and gender differences in perceived relationships with familial and nonfamilial adults. *Journal of Youth and Adolescence*, *V11*, 425-445.
- Bogardus, E. E. (1958). Integration as a current concept. *Sociology and Social Research*, *42*(207-212).
- Boivin, M., Poulin, F., & Vitaro, F. (1994). Depressed mood and peer rejection in childhood. *Development and Psychopathology*, *6*(3), 483-498.
- Bonney, M. E. (1946). A sociometric study of the relationship of some factors to mutual friendships on the elementary, secondary, and college levels. *Sociometry*, *9*(1), 21-47.
- Borelli, J. L., & Prinstein, M. J. (2006). Reciprocal, longitudinal associations among adolescents' negative feedback-seeking, depressive

- symptoms, and peer relations. *Journal of Abnormal Child Psychology*, 34(2), 154-164.
- Borgatti, S. P., & Everett, M. G. (1992). Notions of position in social network analysis. *Sociological Methodology*, 22, 1-35.
- Bosma, H., van de Mheen, H. D., & Mackenbach, J. P. (1999). Social class in childhood and general health in adulthood: questionnaire study of contribution of psychological attributes. *BMJ*, 318, 18-22.
- Bowker, A. (2004). Predicting friendship stability during early adolescence. *Journal of Early Adolescence*, 24(2), 85-112.
- Braithwaite, J. (1989). *Crime, shame, and reintegration*. New York: Cambridge University.
- Brendgen, M., Vitaro, F., Bukowski, W. M., Doyle, A. B., & Markiewicz, D. (2001). Developmental profiles of peer social preference over the course of elementary school: Associations with trajectories of externalizing and internalizing behavior. *Developmental Psychology*, 37(3), 308-320.
- BRIS. (2010). BRIS Annual Report 2010. Stockholm: BRIS.
- Brisette, I., Cohen, S., & Seeman, T. E. (2000). Measuring social integration and social networks. In S. Cohen, L. G. Underwood & B. H. Gottlieb (Eds.), *Social support and intervention. A guide for health and social scientists* (pp. 53-87). New York: Oxford University Press.
- Brolin Låftman, S. (2009). *Children's living conditions*. Stockholm University, Department of Sociology, Stockholm.
- Brolin Låftman, S., & Östberg, V. (2006). The pros and cons of social relations: An analysis of adolescents' health complaints. *Social Science & Medicine*, 63, 611-623.
- Bronfenbrenner, U. (1943). A constant frame of reference for sociometric research. *Sociometry*, 6, 363-396.
- Buhrmester, D., & Furman, W. (1986). The changing functions of friends in childhood: a neo-Sullivanian perspective. In V. G. Derlega & B. A. Winstead (Eds.), *Friendship and social interaction* (pp. 41-52). New York: Springer-Verlag.
- Bukowski, W. M., & Hoza, B. (1989). Popularity and friendship: Issues in theory, measurement, and outcome. In T. J. Berndt & G. W. Ladd (Eds.), *Peer relationships in child development* (pp. 15-45). New York: Wiley.
- Bukowski, W. M., Hoza, B., & Boivin, M. (1994). Measuring friendship quality during pre- and early adolescence: the development and psychometric properties of the friendship qualities scale. *Journal of Social and Personal Relationships*, 11, 471-484.
- Bukowski, W. M., Newcomb, A. F., & Hartup, W. W. (1996). Friendship and its significance in childhood and adolescence: Introduction and comment. In W. M. Bukowski, A. F. Newcomb & W. W. Hartup (Eds.), *he company they keep: Friendship in childhood and adolescence* (pp. 1-15). New York: Cambridge University Press.
- Bukowski, W. M., Newcomb, A. F., & Hoza, B. (1987). Friendship conceptions among early adolescents: a longitudinal study of

- stability and change. *The Journal of Early Adolescence*, 7(2), 143-152.
- Bukowski, W. M., Pizzamiglio, M. T., Newcomb, A. F., & Hoza, B. (1996). Popularity as an affordance for friendship: The link between group and dyadic experiences. *Social Development*, 5, 189-202.
- Burström, B., & Fredlund, P. (2001). Self rated health: Is it as good a predictor of subsequent mortality among adults in lower as in higher social classes. *Journal of Epidemiology and Community Health*, 55, 836-840.
- Burt, R. S. (1980). Models of network structure. *Annual Review of Sociology*, 6, 79-141.
- Cacioppo, J. T., & Hawkley, L. C. (2003). Social isolation and health, with an emphasis on underlying mechanisms. *Perspectives in Biology and Medicine*, 46(3), S39-S52.
- Cairns, R., Leung, M.-C., Buchanan, L., & Cairns, B. D. (1995a). Friendships and social networks in childhood and adolescence: fluidity, reliability, and interrelations. *Child Development*, 66, 1330-1345.
- Cairns, R. B., & Cairns, B. D. (1994). *Lifelines and risks*. Cambridge: Cambridge University Press.
- Cairns, R. B., Cairns, B. D., Neckerman, H. J., Gest, S. D., & Gariépy, J. L. (1988). Social networks and aggressive behavior: Peer support or peer rejection? *Developmental Psychology*, 24(6), 815-823.
- Cairns, R. B., Leung, M.-C., & Cairns, B. D. (1995b). Social networks over time and space in adolescence. In L. J. Crockett & A. C. Crouter (Eds.), *Pathways through adolescence: individual development in relation to social contexts*. New Jersey: Lawrence Erlbaum.
- Cairns, R. B., Perrin, J. E., & Cairns, B. D. (1985). Social structure and social cognition in early adolescence: Affiliative patterns. *Journal of Early Adolescence*, 5, 339-355.
- Caspi, A., Harrington, H., Moffitt, T. E., Milne, B. J., & Poulton, R. (2006). Socially isolated children 20 years later. *Archives of Pediatrics & Adolescent Medicine*, 160(8), 805-811.
- Cassel, J. (1976). The contribution of the social environment to host resistance. *American Journal of Epidemiology*, 104, 107-123.
- Chandola, T., Bartley, M., Sacker, A., Jenkinson, C., & Marmot, M. (2003). Health selection in the Whitehall II study, UK. *Social Science & Medicine*, 56(10), 2059-2072.
- Chen, E., Martin, A. D., & Matthews, K. A. (2006). Understanding health disparities: the role of race and socioeconomic status in children's health. *American Journal of Public Health*, 96(4), 702-708.
- Chen, X., Chang, L., Liu, H., & He, Y. (2008). Effects of the peer group on the development of social functioning and academic achievement: A longitudinal study in Chinese children. *Child Development*, 79(2), 235-251.
- Christensen, P. N., Rothgarber, H., Wood, W., & Matz, D. C. (2004). Social norms and identity relevance: a motivational approach to normative

- behavior. *Personality and Social Psychology Bulletin*, 30, 1295-1309.
- Cillessen, A. H. N., & Mayeux, L. (2004). From censure to reinforcement: Developmental changes in the association between aggression and social status. *Child Development*, 75, 147-163.
- Cillessen, A. H. N., & Mayeux, L. (2007). Expectations and perceptions at school transitions: The role of peer status and aggression. *Journal of School Psychology*, 45, 567-586.
- Cillessen, A. H. N., & Rose, A. J. (2005). Understanding popularity in the peer system. *Current Directions in Psychological Science*, 14(2), 102-105.
- Clasen, D. R., & Brown, B. B. (1985). The multidimensionality of peer pressure in adolescence. *Journal of Youth and Adolescence*, 14(6), 451-468.
- Cohen, J. M. (1977). Sources of peer group homogeneity. *Sociology of Education*, 50, 227-241.
- Cohen, S., Gottlieb, B. H., & Underwood, L. G. (2000). Social relationships and health. In S. Cohen, L. G. Underwood & B. H. Gottlieb (Eds.), *Social support measurement and intervention. A guide for health and social scientists* (pp. 3-28). New York: Oxford University Press.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological bulletin*, 98, 310-357.
- Coie, J. D., Dodge, K. A., & Coppotelli, H. (1982). Dimensions and types of social status: A cross-age perspective. *Developmental Psychology*, 18(4), 557-570.
- Coie, J. D., Dodge, K. A., & Kupersmidt, J. B. (1990). The role of poor peer relationships in the development of disorder. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 17-59). New York: Cambridge University Press.
- Cole, D. A. (1990). Relation of social and academic competence to depressive symptoms in childhood. *Journal of Abnormal Psychology*, 99(4), 422-429.
- Cole, D. A., & Carpentieri, S. (1990). Social status and the comorbidity of child depression and conduct disorder. *Journal of Consulting and Clinical Psychology*, 58(6), 748-757.
- Coleman, J. S. (1961). *The adolescent society: The social life of the teenager and its impact on education*. New York: Free Press.
- Cook, K. S., & Whitmeyer, J. M. (1992). Two approaches to social structure. *Annual Review of Sociology*, 18, 109-127.
- Corsaro, W. A. (1997). *The sociology of childhood*. London: Pine Forge Press.
- Corsaro, W. A., & Rizzo, T. A. (1988). Discussion and friendship: socialization processes in the peer culture of Italian nursery school children. *American Sociological Review*, 53(6), 879-894.
- Cota, A. A., Evans, C. R., Dion, K. L., Kilik, L., & Longman, R. S. (1995). The structure of group cohesion. *Personality and Social Psychology Bulletin*, 21, 572-580.

- Cowen, E. L., Pederson, A., Babigian, H., Izzo, L. D., & Trost, M. A. (1973). Long-term follow-up of early detected vulnerable children. *Journal of Consulting and Clinical Psychology, 41*(3), 438-446.
- Crockett, L. J., Raffaelli, M., & Shen, Y. (2006). Linking self-regulation and risk proneness to risky sexual behavior: pathways through peer pressure and early substance use. *Journal of Research on Adolescence, 16*, 503-525.
- Danese, A., Moffitt, T. E., Harrington, H., Milne, B. J., Polanczyk, G., Pariante, C. M., . . . Caspi, A. (2009). Adverse childhood experiences and adult risk factors for age-related disease. Depression, inflammation, and clustering of metabolic risk markers. *Archives of Pediatrics & Adolescent Medicine, 163*(12), 1135-1143.
- Davey Smith, G. (1997). Down at heart - the meaning and implications of social inequalities in cardiovascular disease. *Journal of Royal College of Physicians, 31*, 414-424.
- Davey Smith, G., Gunnell, D., & Ben-Shlomo, Y. (2001). Life-course approaches to socio-economic differentials in cause-specific adult mortality. In D. Leon & G. Walt (Eds.), *Poverty inequality and health. An international perspective*. Oxford: Oxford University Press.
- de Jong Giervald, J., van Tilburg, T., & Dykstra, P. A. (2006). Loneliness and social isolation. In A. Vangelisti & D. Parلمان (Eds.), *Cambridge handbook of personal relationships* (pp. 485-500). Cambridge: Cambridge University Press.
- de Nooy, W., Mrvar, A., & Batagelj, V. (2005). *Exploratory Social Network Analysis with Pajek* (Vol. 27). Cambridge: Cambridge University Press.
- Degenne, A., & Forsé, M. (1999). *Introducing social networks*. Thousand Oaks, CA: SAGE publications.
- Demir, M., & Urberg, K. A. (2004). Friendship and adjustment among adolescents. *Journal of Experimental Child Psychology, 88*(1), 68-82.
- DeRosier, M. E., Kupersmidt, J. B., & Patterson, C. J. (1994). Children's academic and behavioral adjustment as a function of the chronicity and proximity of peer rejection. *Child Development, 65*, 1799-1813.
- Diewald, M., & Mayer, K. U. (2008). The sociology of the life course and life span psychology *Discussion Papers 772*. Berlin: Deutsches Institut für Wirtschaftsforschung.
- Dishion, T., Andrews, T., & Crosby, L. (1995). Antisocial boys and their friends in early adolescence: Relationship characteristics, quality and interactional process. *Child Development, 66*, 139-151.
- Doll, B. (1996). Children without friends: implications for practice and policy. *School Psychology Review, 25*(2), 165-182.
- Doreian, P., & Stokman, F. N. (1997). *Evolution of social networks*. Amsterdam: Gordon and Breach Publishers.
- Dreesman, H. (1982). Classroom climate: contributions from a European country. *Studies in Educational Evaluation, 8*, 53-64.



- Droomers, M., Schrijvers, C. T. M., van de Mheen, H., & Mackenbach, J. P. (1998). Educational differences in leisure-time physical inactivity: a descriptive and explanatory study. *Social Science & Medicine*, *47*(11), 1665-1676.
- Due, P., Lynch, J., Holstein, B., & Modvig, J. (2003). Socioeconomic health inequalities among a nationally representative sample of Danish adolescents: the role of different types of social relations. *Journal of Epidemiology and Community Health*, *57*, 692-698.
- Durkheim, É. (1897/2002). *Suicide*. London: Routledge Classics.
- Eder, D., & Hallinan, M. T. (1978). Sex differences in children's friendships. *American Sociological Review*, *43*, 237-250.
- Egbonu, L., & Starfield, B. (1982). Child health and social status. *Pediatrics*, *69*(5), 550-558.
- Eisenberg, N., Guthrie, I. K., Cumberland, A., Murphy, B. C., A., S. S., Q., Z., & Carlo, G. (2002). Prosocial development in early adulthood: a longitudinal study. *Journal of Personality and Social Psychology*, *82*(6), 993-1006.
- Elder, G. H. J. (Ed.). (1985). *Life course dynamics*. Ithaca: Cornell University Press.
- Elder, G. H. J., Kirkpatrick Johnson, M., & Crosnoe, R. (2003). The emergence and development of life course theory. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the life course* (pp. 3-19). New York: Kluwer Academic/Plenum Publishers.
- Ellis, W. E., & Zarbatany, L. (2007). Peer group status as a moderator of group influence on children's deviant, aggressive, and prosocial behavior. *Child Development*, *78*(4), 1240-1254.
- Elstad, J. I. (1998). The psycho-social perspective on social inequalities in health. *Sociology of Health and Illness*, *20*(5), 598-618.
- Elstad, J. I. (2000). *Social inequalities in health and their explanations*. Norwegian Social Research, NOVA, Oslo.
- Emerson, E., Graham, H., & Hatton, C. (2006). Household income and health status in children and adolescents in Britain. *European Journal of Public Health*, *16*, 354-360.
- Epstein, J. L. (1986). Friendship selection: developmental and environmental influences. In E. Mueller & C. Cooper (Eds.), *Process and outcome in peer relationships* (pp. 129-160). Orlando, FL: Academic Press.
- Erdley, C. A., Nangle, D. W., Newman, J. E., & Carpenter, E. M. (2001). Children's friendship experiences and psychological adjustment: theory and research. In D. W. Nangle & C. A. Erdley (Eds.), *New directions for child and adolescent development: the role of friendship in psychological adjustment* (pp. 5-23). San Francisco: Jossey-Bass.
- Espelage, D. L., Holt, M. K., & Henkel, R. R. (2003). Examination of peer-group contextual effects on aggression during early adolescence. *Child Development*, *74*(1), 205-220.

- Estell, D. B., Farmer, T. W., Pearl, R., van Acker, R., & Rodkin, P. C. (2008). Social status and aggressive and disruptive behavior in girls: Individual, group, and classroom influences. *Journal of School Psychology, 46*, 193-212.
- Eurostat (Ed.). (1998). *Causes of death: 1994-1995 statistics. Eurostat Working Papers: Population and social conditions* (Vol. 3/199/E/No 22). Luxembourg.
- Farrington, D. P., & Ttofi, M. M. (2009). School-based programs to reduce bullying and victimization. *Campbell Systematic Reviews* 2009:6. 10.4073/csr.2009.6.
- Field, T., Diego, M., & Sanders, C. (2001). Adolescent depression and risk factors. *Adolescence, 36*(143), 491-498.
- Fiske, A. P. (1992). The four elementary forms of sociality: framework for a unified theory of social relations. *Psychological Review, 99*(4), 689-723.
- Fontaine, R. G., Yang, C., Burks, V. S., Dodge, K. A., Price, J. M., Pettit, G. S., & Bates, J. E. (2009). Loneliness as a partial mediator of the relation between low social preference in childhood and anxious/depressed symptoms in adolescence. *Development and Psychopathology, 21*, 479-491.
- Fox, A. J. (1989). *Health inequalities in European countries*. Aldershot: Gower Publishing Company Limited.
- Freeman, L. C. (2000). Visualizing social networks. *Journal of Social Structure, 1*(1).
- Freeman, L. C. (2004). *The development of social network analysis*. Vancouver, BC: Empirical Press.
- Furman, W. (1996). The measurement of friendship perceptions: Conceptual and methodological issues In W. M. Bukowski (Ed.), *The company they keep: Friendship in childhood and adolescence* (pp. 41-65). Cambridge: Cambridge University Press.
- Galobardes, B., Lynch, J. W., & Davey Smith, G. (2008). Is the association between childhood cause-specific mortality and childhood socioeconomic circumstances established? Update of a systematic review. *Journal of Epidemiology and Community Health, 62*, 387-390.
- Garton, L., Haythornwaite, C., & Wellman, B. (1997). Studying online social networks. *Journal of Computer Mediated Communication, 3*(1), 0.
- Gazelle, H., & Ladd, G. W. (2003). Anxious solitude and peer exclusion: A diathesis-stress model of internalizing trajectories in childhood. *Child Development, 74*(1), 257-278.
- Gecas, V., & Schwalbe, M. L. (1983). Beyond the looking-glass self: social structure and efficacy-base self-esteem. *Social Psychology Quarterly, 46*, 77-88.
- George, L. K. (1993). Sociological perspectives on life transitions. *Annual Review of Sociology, 19*, 353-373.
- Gest, S. D., Davidson, A. J., Rulison, K. L., Moody, J., & Welsh, J. A. (2007). Features of groups and status hierarchies in girls' and boys' early

- adolescent peer networks. *New Directions for Child and Adolescent Development*, 118, 43-60.
- Gest, S. D., Graham-Bermann, S. A., & Hartup, W. W. (2001). Peer experience: Common and unique features of number of friendships, social network centrality, and sociometric status. *Social Development*, 10(1), 23-40.
- Gifford-Smith, M. E., & Brownell, C. A. (2003). Childhood peer relationships: social acceptance, friendships, and peer networks. *Journal of School Psychology*, 41, 235-284.
- Graham, H. (2000). *Understanding Health Inequalities*. Buckingham: Open University Press.
- Graham, H. (2004). Social determinants and their unequal distribution: clarifying policy understandings. *The Milbank Quarterly*, 82(1), 101-124.
- Graham, H., & Power, C. (2004). Childhood disadvantage and health inequalities: A framework for policy based on lifecourse research. *Child: Care, Health & Development*, 30(6671-678).
- Granovetter, M. (1974). *Getting a job*. Harvard University Press: Cambridge, MA.
- Gronlund, N. E. (1959). *Sociometry in the classroom*. New York: Harper & Brothers.
- Gropeter, J. K., & Crick, N. R. (1996). Relational aggression, overt aggression, and friendship. *Child Development*, 67, 2328-2338.
- Güroglu, B., van Lieshout, C. F. M., Haselager, G. J. T., & Scholte, R. H. J. (2007). Similarity and complementarity of behavioral profiles of friendship types and types of friends: friendships and psychosocial adjustment. *Journal of Research on Adolescence*, 17(2), 357-386.
- Hagestad, G. O., & Neugarten, B. L. (1985). Age and the life course. In R. H. Binstock & E. Shanas (Eds.), *Handbook of aging and the social sciences* (pp. 35-61). New York: Van Nostrand Reinhold.
- Halinan, M. (1974). *The structure of positive sentiment*. New York: Elsevier.
- Hallqvist, J., Lynch, J., Bartley, M., Land, T., & Blane, D. (2004). Can we disentangle life course processes of accumulation, critical period and social mobility? An analysis of disadvantaged socio-economic positions and myocardial infarction in the Stockholm Heart Epidemiology Program. *Social Science & Medicine*, 58(8), 1555-1562.
- Hansell, S. (1985). Adolescent friendship networks and distress in school. *Social Forces*, 63, 698-715.
- Hartup, W. W. (1984). The peer context in middle childhood. In W. A. Collins (Ed.), *Development during middle childhood* (pp. 240-282). Washington D. C.: National Academy Press.
- Hartup, W. W. (1989). Social relationships and their developmental significance. *American Psychologist*, 44(2), 120-126.
- Hartup, W. W. (1996). The company they keep: Friendships and their developmental significance. *Child Development*, 59, 1-13.

- Hartup, W. W., & Stevens, N. (1997). Friendships and adaption in the life course. *Psychological Bulletin*, *121*(3), 355-370.
- Hawley, P. H. (2003). Prosocial and coercive configurations of resource control in early adolescence: A case for the well-adapted Machiavellian. *Merrill-Palmer Quarterly* *49*, 279-309.
- Haynie, D. L. (2001). Delinquent peers revisited: does network structure matter? *American Journal of Sociology*, *106*(4), 1013-1057.
- Hayvren, M., & Hymel, S. (1984). Ethical issues in sociometric testing: The impact of sociometric measures on interactive behavior. *Developmental Psychology*, *20*, 844-849.
- Heilbron, N., & Prinstein, M. J. (2010). Adolescent peer victimization, peer status, suicidal ideation, and nonsuicidal self-injury. *Merill-Palmer Quarterly*, *56*(3), 388-419.
- Heimer, K., & Matsueda, R. L. (1994). Role-taking, role commitment, and delinquency: a theory of differential social control. *American Sociological Review*, *59*, 365-390.
- Herman, K. C., Reinke, W. M., Parkin, J., Traylor, K. B., & Agarwal, G. (2009). Childhood depression: rethinking the role of the school. *Psychology in the Schools*, *46*(5), 433-446.
- Hetherington, E. M. (1999). Social capital and the development of youth from nondivorced, divorced, and remarried families. In W. A. Collins & B. Laursen (Eds.), *Relationships as developmental contexts*. Mahwah, NJ: Erlbaum.
- Holahan, C., & Moos, R. H. (1987). Personal and contextual determinants of coping strategies. *Journal of Personality and Social Psychology*, *52*(5), 946-955.
- Holahan, C. K., & Holahan, C., J. (1987). Self-efficacy, social support, and depression in aging: a longitudinal analysis. *Journal of Gerontology*, *42*(1), 65-68.
- Holder, M. D., & Coleman, B. (2007). The contribution of social relationships to children's happiness. *Journal of Happiness Studies*, doi: 10.1007/s10902-10007-19083-10900.
- Holland, P. W., & Leinhardt, S. (1973). The structural implications of measurement error in sociometry. *Journal of Mathematical Sociology*, *3*, 85-111.
- House, J. (1981). *Work stress and social support*. Reading, MA: Addison-Wesley.
- House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, *241*, 540-545.
- Hughes, M., & Gove, W. R. (1981). Living alone, social integration, and mental health. *The American Journal of Sociology*, *87*(1), 48-74.
- Hunt, J. M., & Solomon, R. L. (1942). The stability and some correlates of group status in a summer camp group of young boys. *American Journal of Psychology*, *55*, 33-55.
- Hymel, S., Rubin, K. H., Rowden, L., & LeMare, L. (1990). Children's peer relationships: Longitudinal prediction of internalizing and

- externalizing problems from middle to late childhood. *Child Development*, 61, 2004-2021.
- Ibarra, H. (1993). Network centrality, power, and innovation involvement: determinants of technical and administrative roles. *The Academy of Management Journal*, 36(3), 471-501.
- Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: a review of twenty-seven community studies. *Journal of Health and Social Behaviour*, 38(1), 21-37.
- Inderbitzen, H., Walters, K. S., & Bukowski, A. L. (1997). The role of social anxiety in adolescent peer relations: differences among sociometric status groups and rejected subgroups. *Journal of Clinical Child Psychology*, 26(4), 338-348.
- Israel, J. (1963). *Socialpsykologi [Social psychology]*. Stockholm: Svenska bokförlaget/Norstedts.
- Janson, C.-G. (1975). Project Metropolitan - A presentation. Stockholm: Stockholm University, Department of Sociology.
- Jennings, H. H. (1941). Sociometry and social theory. *American Sociological Review*, 6(4), 512-522.
- Jiang, X. L., & Cillessen, A. H. (2005). Stability of continuous measures of sociometric status: A meta-analysis. *Developmental Review of Educational Research*, 25, 1-25.
- Kadushin, C. (2005). Who benefits from network analysis: ethics of social network research. *Social Networks*, 27(2), 139-153.
- Karvonen, S., Vikat, A., & Rimpelä, M. (2005). The role of school context in the increase in young people's health complaints in Finland. *Journal of Adolescence*, 28, 1-16.
- Keisner, J. (2002). Depressive symptoms in early adolescence: Their relations with classroom problem behavior and peer status. *Journal of Research on Adolescence*, 12(4), 463-478.
- Kendler, K. S., Thornton, L. M., & Prescott, C. A. (2001). Gender differences in the rates of exposure to stressful life events and sensitivity to their depressogenic effects. *American Journal of Psychiatry*, 158, 587-593.
- Kennedy, B. P., Kawachi, I., Glass, R., & Prothrow-Stith, D. (1998). Income distribution, socioeconomic status, and self rated health in the United States: multilevel analysis. *BMJ*, 317(7163), 917-921.
- Kessler, R. C., & McLeod, J. D. (1984). Sex differences in vulnerability to undesirable life events. *American Sociological Review*, 49, 620-631.
- Kiesner, J., Poulin, F., & Nicotra, E. (2003). Peer relations across contexts: individual-network homophily and network inclusion in and after school. *Child Development*, 74(5), 1328-1343.
- Kindermann, T. A. (1993). Natural peer groups as contexts for individual development: the case of children's motivation in school. *Developmental Psychology*, 29(6), 970-977.
- King, M. B. (1961). Socioeconomic status and sociometric choice. *Social Forces*, 39(3), 199-206.

- Kingery, J. N., & Erdley, C. A. (2007). Peer experiences as predictors of adjustment across the middle school transition. *Education and Treatment of Children, 30*(2), 73-88.
- Kiuru, N., Burk, W. J., Laursen, B., Salmela-Aro, K., & Nurmi, J.-E. (2010). Pressure to drink but not to smoke: disentangling selection and socialization in adolescent peer networks and peer groups. *Journal of Adolescence*, doi:10.1016/j.adolescence.2010.1007.1006.
- Klov Dahl, A. S. (1985). Social networks and the spread of infectious diseases: The AIDS example. *Social Science & Medicine, 21*(11), 1203-1216.
- Knoke, D., & Kuklinski, J. H. (1982). *Network analysis*. Newbury Park: Sage Publications.
- Knox, H., Savage, M., & Harvey, P. (2006). Social networks and the study of relations: networks as a method, metaphor and form. *Economy and Society, 35*(1), 113-140.
- Kresanov, K., Touminen, J., Piha, J., & Almqvist, F. (1998). Validity of child psychiatric screening methods. *European Child & Adolescent Psychiatry, 7*, 85-95.
- Krueger, P. M., & Chang, V. W. (2008). Being poor and coping with stress: health behaviors and the risk of death. *American Journal of Public Health, 98*(5), 889-896.
- Kuh, D., Ben-Schlomo, Y., Lynch, J., Hallqvist, J., & Power, C. (2003). Life course epidemiology. *Journal of Epidemiology and Community Health, 57*, 778-783.
- Kupersmidt, J. B., & Coie, J. D. (1990). Preadolescent peer status, aggression, and school adjustment as predictors of externalizing problems in adolescence. *Child Development, 61*, 1350-1362.
- Kupersmidt, J. B., DeRosier, M. E., & Patterson, C. P. (1995). Similarity as the basis for children's friendships: The roles of sociometric status, aggressive and withdrawn behavior, academic achievement, and demographic characteristics. *Journal of Social and Personal Relationships, 12*, 439-452.
- Ladd, G. W. (1990). Having friends, keeping friends, making friends, and being liked by peers in the classroom: predictors of children's early school adjustment? *Child Development, 61*, 1081-1100.
- Ladd, G. W. (1999). Peer relationships and social competence during early and middle childhood. *Annual Review of Psychology, 50*, 333-359.
- Ladd, G. W., & Oden, S. (1979). The relationship between peer acceptance and children's ideas about helpfulness. *Child Development, 50*, 402-408.
- Ladd, G. W., & Troop-Gordon, W. (2003). The role of chronic peer difficulties in the development of children's psychological adjustment problems. *Child Development, 74*(5), 1344-1367.
- Ladd, S. (1984). Social skill training with children: Issues in research and practice. *Clinical Psychology Review, 4*, 317-337.
- Laursen, B. (2010). Capturing the peer context: the paradox of progress. *Journal of Adolescence*, doi:10.1016/j.adolescence.2010.1008.1008.

- Laursen, B., Bukowski, W. M., Aunola, K., & Numri, J.-E. (2007). Friendship moderates prospective associations between social isolation and adjustment problems in young children. *Child Development, 78*(4), 1395-1404.
- Lawler, E. J., Ridgeway, C., & Markovsky, B. (1993). Structural social psychology and the micro-macro problem. *Sociological Theory, 11*(3), 268-290.
- Lawlor, D. A., Batty, G. D., Morton, S. M. B., Clark, H., Macintyre, S., & Leon, D. A. (2005). Childhood socioeconomic position, educational attainment, and adult cardiovascular risk factors: The Aberdeen Children of the 1950s Cohort Study. *American Journal of Public Health, 95*(7), 1245-1251.
- Lawlor, D. A., Sterne, J. A. C., Tynelius, P., Davey Smith, G., & Rasmussen, F. (2006). Association of childhood socioeconomic position with cause-specific mortality in a prospective record linkage study of 1,839,384 individuals. *American Journal of Epidemiology, 164*(9), 907-915.
- Lease, A. M., Kennedy, C. A., & Axelrod, J. L. (2002). Children's social constructions of popularity. *Social Development, 11*(1), 87-109.
- Leon, D. A., Lawlor, D. A., Clark, H., & Macintyre, S. (2006). Cohort profile: The Aberdeen Children of the 1950s Study. *International Journal of Epidemiology, 35*, 549-552.
- Li, J., Mattes, E., McMurray, A., Hertzman, C., & Stanley, F. (2009). Social determinants of child health and well-being. *Health Sociology Review, 18*(1), 3-11.
- Lin, N., Ensel, W., & Vaughn, J. (1981). Social resources and strength of ties: structural factors in occupational status attainment. *American Sociological Review, 46*, 393-405.
- Link, B. G., & Phelan, J. (1995). Social conditions as fundamental causes of disease. *Journal of Health and Social Behavior*(Extra issue), 80-94.
- Litwak, E., & Szelenyi, I. (1969). Primary group structures and their functions: kin, neighbors, and friends. *American Sociological Review, 34*(4), 465-481.
- Loomis, C. P., & Pepinsky, H. B. (1948). Sociometry, 1937-1947: theory and methods. *Sociometry, 11*(3), 262-286.
- Lopez, C., & DuBois, D. L. (2005). Peer victimization and rejection: investigation of an integrative model of effects on emotional, behavioral, and academic adjustment in early adolescence. *Journal of Clinical Child and Adolescent Psychology, 34*(1), 25-36.
- Lubben, J. E. (1988). Assessing social networks among elderly populations. *Family and Community Health, 11*(3), 42-52.
- Lundberg, O. (1997). Childhood conditions, sense of coherence, social class and adult ill health: exploring their theoretical and empirical relations. *Social Science & Medicine, 44*(6), 821-831.
- Lundberg, O., & Manderbacka, K. (1996). Assessing reliability of a measure of self-rated health. *Scandinavian Journal of Public Health, 24*, 218-224.

- Maccoby, E. E. (1990). Gender and relationships: A developmental account. *American Psychologist*, *45*(4), 513-520.
- Maccoby, E. E. (1998). *The two sexes: growing up apart, coming together*. Cambridge, MA: Standford University Press.
- Maccoby, E. E., & Jacklin, C. N. (1987). Gender segregation in childhood. In H. W. Reese (Ed.), *Advances in child development and behavior* (Vol. 20, pp. 239-287). Orlando, FL: Academic Press.
- Marmot, M. (2004). *The status syndrome. How social standing affects our health and longevity*. New York: Times Books.
- Marmot, M., Ryff, C. D., Bumpass, L. L., Shipley, M., & Marks, N. F. (1997). Social inequalities in health: Next questions and converging evidence. *Social Science & Medicine*, *44*(6), 901-910.
- Marmot, M. G., Shipley, M. J., & Rose, G. (1984). Inequalities in death - specific explanations of a general pattern? *Lancet*, *323*(8384), 1003-1006.
- Marmot, M. G., & Wilkinson, R. (1999). *Social determinants of health*. Oxford: Oxford University Press.
- Marsden, P. V., & Friedkin, N. E. (1994). Network studies of social influence. In S. Wasserman & J. Galaskiewicz (Eds.), *Advances in social network analysis: research in the social and behavioral sciences* (pp. 3-25). Thousand Oaks, CA: SAGE Publications.
- Martikainen, P., Aromaa, A., Heliövaara, M., Klaukka, T., Knekt, P., Maatela, J., & Lahelma, E. (1999). Reliability of perceived health by sex and age. *Social Science & Medicine*, *48*(8), 1117-1122.
- Maruyama, G., Miller, N., & Holtz, R. (1986). The relation between popularity and achievement: A longitudinal test of the lateral transmission of the value hypothesis. *Journal of Personality and Social Psychology*, *51*(4), 730-741.
- Marx, K., & Engels, F. (1948/1998). *The communist manifesto*. London: ElecBook London.
- McGuire, K. D., & Weisz, J. R. (1982). Social cognition and behavior correlates of preadolescent chumship. *Child Development*, *53*, 1478-1484.
- Mead, G. H. (1934). *Mind, self and society*. Chicago: The University of Chicago Press.
- Merton, R. K. (1938). Social Structure and Anomie. *American Sociological Review*, *3*, 672-682.
- Mikami, A. Y., Jack, A., Emeh, C. C., & Stephens, H. F. (2010). Parental influence on children with attention-deficit hyperactivity disorder: I. Relationships between parent behaviors and child peer status. *Journal of Abnormal Child Psychology*, *38*(6), 721-736.
- Mikami, A. Y., Szvedo, D. E., Allen, J., P., Evans, M. A., & Hare, A. L. (2010). Adolescent peer relationships and behavior problems predict young adults' communication on social networking websites. *Developmental Psychology*, *46*(1), 46-56.
- Modin, B., & Östberg, V. (2009). School climate and psychosomatic health. A multilevel analysis of nearly 20,000 ninth-grade students in the



- greater Stockholm area. *Submitted to School Effectiveness and School Improvement.*
- Modin, B., Östberg, V., & Almquist, Y. (2010). Childhood peer status and adult susceptibility to anxiety and depression. A 30-year follow-up of Stockholm girls. *Journal of Abnormal Child Psychology*, doi: 10.1007/s10802-10010-19462-10806.
- Moilanen, I., Almqvist, F., Piha, J., Räsänen, E., & Tamminen, T. (1988). An epidemiological survey of child psychiatry in Finland. *Nordic Journal of Psychiatry*, 42(s18), 9-11.
- Moore, S. G. (1967). Correlates of peer acceptance in nursery school children. In W. W. Hartup & N. L. Smothergill (Eds.), *The young child* (pp. 229-247). Washington DC: National Association for the Education of Young Children.
- Moreno, J. L. (1934). Who shall survive? A new approach to the problem of human interrelations *Nervous and mental disease monograph series, no 58*. Washington D. C.: Nervous and Mental Disease Publishing Co.
- Moreno, J. L. (1951). *Sociometry, experimental method and the science of society*. New York: Beacon House.
- Mossey, J. M., & Shapiro, E. (1982). Self-rated health: A predictor of mortality among the elderly. *American Journal of Public Health*, 72, 800-808.
- Murberg, T. A., & Bru, E. (2004). School-related stress and psychosomatic symptoms among Norwegian adolescents. *School Psychology International*, 25(3), 317-332.
- Nangle, D. W., Erdley, C. A., Newman, J. E., Mason, C. A., & Carpenter, E. M. (2003). Popularity, friendship quantity, and friendship quality: interactive influences on children's loneliness and depression. *Journal of Clinical Child and Adolescent Psychology*, 32(4), 546-555.
- Nangle, D. W., Erdley, C. A., Zeff, K. R., Stanchfield, L. L., & Gold, J. A. (2004). Opposites do not attract: social status and behavioral-style concordances and discordances among children and the peers who like or dislike them. *Journal of Abnormal Child Psychology*, 32(4), 425-434.
- Newcomb, A. F., & Bukowski, W. M. (1983). Social impact and social preferences as determinants of children's peer group status. *Developmental Psychology*, 19, 856-867.
- Newcomb, A. F., Bukowski, W. M., & Pattee, L. (1993). Children's peer relations: A meta-analytic review of popular, rejected, neglected, controversial, and average sociometric status. *Psychological Bulletin*, 113(1), 99-128.
- Nishiwaki, Y., Clark, H., Morton, S. M., & Leon, D. A. (2005). Early life factors, childhood cognition and postal questionnaire response rate in middle age: The Aberdeen children of the 1950s study. *BMC Medical Research Methodology*, 5, 16.

- Northway, M. L. (1940). A method for depicting social relationships obtained by sociometric testing. *Sociometry*, 3(2), 144-150.
- Notley, T. (2009). Young people, online networks, and social inclusion. *Journal of Computer-Mediated Communication*, 14(4), 1208-1227.
- Oksman, V., & Turtiainen, J. (2004). Mobile communication as a social stage: meanings of mobile communication in everyday life among teenagers in Finland. *New Media Society*, 6, 319-339.
- Ollendick, T. H., Weist, M. D., Borden, M. C., & Greene, R. W. (1992). Sociometric status and academic, behavioral, and psychological adjustment: A five-year longitudinal study. *Journal of Consulting and Clinical Psychology in the Schools*, 60, 80-87.
- Panak, W. F., & Garber, J. (1992). Role of aggression, rejection, and attributions in the prediction of depression in children. *Development and Psychopathology*, 4(1), 145-165.
- Parke, R. D., & Ladd, G. W. (1992). *Family-peer relations: modes of linkage*. Hillsdale, NJ: Erlbaum.
- Parker, J. G., & Asher, S. R. (1987). Peer relations and later personal adjustment: Are low-accepted children at risk? *Psychological Bulletin*, 102(3), 357-389.
- Parker, J. G., & Asher, S. R. (1993). Friendship and friendship quality in middle childhood: Links with peer group acceptance and feelings of loneliness and social dissatisfaction. *Developmental Psychology*, 29(4), 611-621.
- Parker, J. G., & Herrera, C. (1996). Interpersonal processes in friendship: a comparison of abused and nonabused children's experiences. *Developmental Psychology*, 32, 1025-1038.
- Parker, J. G., Rubin, K. H., Erath, S. A., Wojslawowicz, J. C., & Buskirk, A. A. (2006). Peer relationships, child development, and adjustment: a developmental psychopathology perspective. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology: theory and method* (pp. 419-493). New Jersey: John Wiley & Sons.
- Parker, J. G., & Seal, J. (1996). Forming, losing, renewing, and replacing friendships: Applying temporal parameters to the assessment of children's friendship experiences. *Child Development*, 67, 2248-2268.
- Parkhurst, J. T., & Hopmeyer, A. (1998). Sociometric popularity and peer-perceived popularity: Two distinct dimensions of peer status. *Journal of Early Adolescence*, 18(2), 125-144.
- Parsons, T. (1959). The school class as a social system: some of its functions in American society. *Harvard Educational Review*, 297-318.
- Parsons, T., Shils, E., Naegele, K., & Pitts, J. (1961). *Theories of Society: Foundations of Modern Sociological Theory*. New York: The Free Press.
- Pearlin, L. I. (1989). The sociological study of stress. *Journal of Health and Social Behavior*, 30, 241-256.

- Piper, W. E., Marrache, M., Lacroix, R., Richardsen, A. M., & Jones, B. D. (1983). Cohesion as a basic bond in groups. *Human Relations*, *36*, 92-108.
- Prinstein, M. J., & Cillessen, A. H. N. (2003). Forms and functions of adolescent peer aggression association with high levels of peer status. *Merill-Palmer Quarterly*, *49*(3), 310-342.
- Prout, A., & James, A. (2005). A new paradigm for the sociology of childhood? In C. Jenks (Ed.), *Childhood: critical concepts in sociology* (Vol. 1). New York: Routledge.
- Raphael, D. (2004). *Social determinants of health: Canadian perspectives*. Toronto: Canadian Scholars' Press.
- Ray, G. E., Cohen, R., & Secrist, M. E. (1995). Best friend networks of children across settings. *Child Study Journal*, *25*, 169-188.
- Ridgeway, C. (2003). Social status and group structure. In M. A. Hogg & R. S. Tindale (Eds.), *Blackwell handbook of social psychology: group processes*. Oxford: Blackwell Publishers.
- Ridgeway, C. L., & Walker, H. A. (1995). Status structures. In K. S. Cook, G. A. Fine & J. S. House (Eds.), *Sociological perspectives on social psychology* (pp. 281-310). Boston: Allyn & Bacon.
- Ringbäck Weitoft, G., & Rosén, M. (2005). Is perceived nervousness and anxiety a predictor of premature mortality and severe morbidity? A longitudinal follow up of the Swedish survey of living conditions. *Journal of Epidemiology and Community Health*, *59*, 794-798.
- Roff, J. D., & Wirt, R. D. (1984). Childhood social adjustment, adolescent status, and young adult mental health. *American Journal of Orthopsychiatry*, *54*(4), 595-602.
- Rose-Krasnor, L. (1997). The nature of social competence: A theoretical review. *Social Development*, *6*(1), 111-135.
- Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin*, *132*(1), 98-131.
- Ross, C. E., & Wu, C.-l. (1995). The links between education and health. *American Sociological Review*, *60*(5), 719-745.
- Rubin, K. H., Bukowski, W., & Parker, J. G. (1998). Peer interactions, relationships, and groups. In W. Darnon & N. Eisenberg (Eds.), *Handbook of child psychology* (pp. 619-700). New York: John Wiley.
- Rubin, K. H., Hymel, S., Mills, R. S. L., & Rose-Krasnor, L. (1991). Conceptualizing different developmental pathways to and from social isolation in childhood. In D. Cicchetti & S. L. Toth (Eds.), *Internalizing and externalizing expressions of dysfunction*. Hillsdale, NJ: Lawrence Erlbaum.
- Rubin, K. H., Wojslawowicz, J. C., Rose-Krasnor, L., Booth-LaForce, C., & Burgess, K. B. (2006). The best friendships of shy/withdrawn children: Prevalence, stability, and relationship quality. *Journal of Abnormal Child Psychology*, *34*, 143-157.

- Rutter, M. (1965). Classification and categorization in child psychiatry. *Journal of Child Psychology and Psychiatry*, 6, 71-83.
- Rutter, M. (1967). A children's behaviour questionnaire for completion by teachers: Preliminary findings. *Journal of Child Psychology and Psychiatry*, 8, 1-11.
- Ryan, A. M., & Patrick, H. (2001). The classroom social environment and changes in adolescents' motivation and engagement during middle school. *American Educational Research Journal*, 38, 437-460.
- Salvy, S.-J., Roemmich, J. N., Bowker, J. C., Romero, N. D., Stadler, P. J., & Epstein, L. H. (2009). Effect of peers and friends on youth physical activity and motivation to be physically active. *Journal of Pediatric Psychology*, 34(2), 217-225.
- Scheff, T. J. (1988). Shame and conformity: the deference-emotion system. *American Sociological Review*, 53(3), 395-406.
- Schmuck, R. A., & Schmuck, P. A. (1975). *Group processes in the classroom*. Dubuque, Iowa: Wm. C. Brown Company Publishers.
- Schwartz, D., Hopmeyer Gorman, A., Nakamoto, J., & McKay, T. (2006). Popularity, social acceptance, and aggression in adolescent peer groups: Links with academic performance and school attendance. *Developmental Psychology*, 42(6), 1116-1127.
- Scott, J. (1988). Social network analysis. *Sociology*, 22, 109-127.
- Settersten, R. A. J. (2009). It takes two to tango: the (un)easy dance between life-course sociology and life-span psychology. *Advances in Life Course Research*, 14, 74-81.
- Shantz, C. U., & Shantz, D. W. (1985). Conflict between children: Social cognitive and sociometric correlates. In M. W. Berkowitz (Ed.), *Peer conflict and psychological growth* (pp. 3-21). San Francisco: Jossey-Bass.
- Sherif, M. (1936). *The psychology of social norms*. New York: Harper & Row.
- Shrum, W., Cheek, N. H. J., & Hunter, S. M. (1988). Friendship in school: gender and racial homophily. *Sociology of Education*, 61(4), 227-239.
- Simmel, G. G. S., ed. by Donald N. Levine. University of Chicago Press, 1971. (Ed.). (1908/1971). *On Individuality and Social Forms*. Chicago: University of Chicago Press.
- Skolverket. (2011). Utvärdering av metoder mot mobbning [Evaluation of methods against bullying]. Rapport 353.
- Spijker, J. J. A. (2004). *Socioeconomic determinants of regional mortality differences in Europe*. Groningen: University of Groningen.
- Stenberg, S.-Å., Vågerö, D., Österman, R., Arvidsson, E., von Otter, C., & Janson, C.-G. (2006). Stockholm Birth Cohort Study 1953-2003: A new tool for life-course studies. *Scandinavian Journal of Public Health*, 35(1), 104-110.
- Stocker, C. M., & Richmond, M. K. (2007). Longitudinal associations between hostility in adolescents' family relationships and friendships

- and hostility in their romantic relationships. *Journal of Family Psychology*, 21(3), 490-497.
- Stütz, G. (1985). *Kamratstatus (Peer status)*. Stockholm University, Stockholm.
- Sullivan, C. J. (2006). Early adolescent delinquency: assessing the role of childhood problems, family environment, and peer pressure. *Youth Violence and Juvenile Justice*, 4, 291-313.
- Sullivan, H. S. (1953). *The interpersonal theory of psychiatry*. New York: Norton.
- Sund, A. M., Larsson, B., & Wichstrom, L. (2003). Psychosocial correlates of depressive symptoms among 12-14-year-old Norwegian adolescents. *Journal of Child Psychology and Psychiatry*, 44(4), 588-597.
- Syme, S. L. (1998). Social and economic disparities in health: thoughts about intervention. *Millbank Quarterly*, 76(3), 493-506.
- Terry, R. (2000). Recent advances in measurement theory and the use of sociometric techniques. *New Directions for Child & Adolescent Development*, 88, 27-53.
- Thoits, P. A. (1983). Multiple identities and psychological well-being: a reformulation and test of the social isolation hypothesis. *American Sociological Review*, 48(2), 174-187.
- Thompson, G. G. (1960). Children's groups. In P. H. Mussen (Ed.), *Handbook of research methods in child development* (pp. 821-853). New York: Wiley.
- Thorne, B. (1993). *Gender play: Girls and boys in school*. New Brunswick, NJ: Rutgers University Press.
- Torsheim, T., & Wold, B. (2001). School-related stress, support, and subjective health complaints among early adolescents: a multilevel approach. *Journal of Adolescence*, 24, 701-713.
- Townsend, P. (1979). *Poverty in the United Kingdom*. Penguin: Harmondsworth.
- Turner, B. (1987). *Medical power and social knowledge*. London: Sage.
- Turner, R. J., Wheaton, B., & Lloyd, D. A. (1995). The epidemiology of social stress. *American Sociological Review*, 60, 104-125.
- Tönnies, F. (1882/2001). *Community and civil society*. New York: Cambridge University Press.
- Ueno, K. (2005). The effects of friendship networks on adolescent depressive symptoms. *Social Science Research*, 34(3), 484-510.
- Urberg, K. A., Degirmencioglu, S. M., & Tolson, M. (1998). Adolescent friendship selection and termination: The role of similarity. *Journal of Social and Personal Relationships*, 15, 703-710.
- Urduan, T., & Schoenfelder, E. (2006). Classroom effects on student motivation: goal structures, social relationships, and competence beliefs. *Journal of School Psychology*, 44(5), 331-349.
- Wahrman, R. (1972). Status, deviance, and sanctions: A critical review. *Small Group Behavior*, 3, 203-223.

- Valente, T. W., Unger, J. B., & Johnson, C. A. (2005). Do popular students smoke? The association between popularity among middle school students. *Journal of Adolescent Health, 37*(4), 323-329.
- Walsh, S., Harel-Fisch, Y., & Fogel-Grinvald, H. (2010). Parents, teachers and peer relations as predictors of risk behaviors and mental well-being among immigrant and Israeli born adolescents. *Social Science & Medicine, 70*(7), 976-984.
- Van den Oord, E. J. C. G., & Rispens, J. (1999). Differences between school classes in preschooler's psychosocial adjustment: evidence for the importance of children's interpersonal relations. *Journal of Child Psychology and Psychiatry, 40*, 417-430.
- van den Oord, E. J. C. G., & van Rossem, R. (2002). Differences in first graders' school adjustment: the role of classroom characteristics and social structure of the group. *Journal of School Psychology, 40*(5), 371-394.
- Vandell, D. L., & Hembree, S. E. (1994). Peer social status and friendship: Independent contributors to children's social and academic adjustment. *Merrill-Palmer Quarterly, 40*, 461-477.
- Wasserman, S., & Faust, K. (1994). *Social Network Analysis: Methods and Applications*. Cambridge: Cambridge University.
- Wasserman, S., & Galaskiewicz, J. (1994). *Research in the behavioral sciences*. Thousand Oaks, CA: SAGE Publications.
- Wellman, B. (1983). Network analysis: some basic principles. *Sociological Theory, 1*, 155-200.
- Wellman, B. (1988). Structural analysis: from method and metaphor to theory and substance. In B. Wellman & S. D. Berkowitz (Eds.), *Social structures: a network approach*. New York: Cambridge University Press.
- Wentzel, K. R. (1991). Relations between social competence and academic achievement in early adolescence. *Child Development, 62*, 1066-1078.
- Wentzel, K. R., & Asher, S. R. (1995). The academic lives of neglected, rejected, popular, and controversial children. *Child Development, 66*, 754-763.
- Wentzel, K. R., & Caldwell, K. A. (1997). Friendships, peer acceptance, and group membership: Relations to academic achievement in middle school. *Child Development, 68*(6), 1198-1209.
- Wentzel, K. R., Caldwell, K. A., & Barry, C. N. (2004). Friendships in middle school: Influences on motivation and school adjustment. *Journal of Educational Psychology, 96*(2), 195-203.
- Williams, G. H. (2003). The determinants of health: structure, context and agency. *Sociology of Health and Illness, 25*(3), 131-154.
- Williams, S. J. (1995). Theorising class, health and lifestyles: can Bourdieu help us? *Sociology of Health & Illness, 17*(5), 577-604.
- Vitaro, F., Tremblay, R. E., Kerr, M., Pagani, L., & Bukowski, W. M. (1997). Disruptiveness, friends' characteristics, and delinquency in early

- adolescence: A test of two competing models of development. *Child Development*, 68, 676-689.
- Woodward, L. J., & Fergusson, D. M. (2000). Childhood peer relationship problems and later risks of educational under-achievement and unemployment. *Journal of Child Psychology and Psychiatry*, 41(2), 191-201.
- Vågerö, D., & Illsley, R. (1995). Explaining health inequalities beyond Black and Barker. *European Sociological Review* 11, 219-241.
- Vågerö, D., & Lundberg, O. (1989). Health inequalities in Britain and Sweden. *The Lancet*, 334(8653), 35-36.
- Yang, H.-H., Wu, C.-I., Lei, M. K., & Yang, H.-J. (2009). How many are good enough for the adolescent social network nomination? *SWSEAS Transactions on Mathematics*, 8(7), 299-308.
- Östberg, V. (1996). *Social structure and children's life chances*. Stockholm University, Stockholm.
- Östberg, V. (2003). Children in classrooms: Peer status, status distribution and mental well-being. *Social Science & Medicine*, 53, 17-29.
- Östberg, V., & Modin, B. (2007). Status relations in school and their relevance for health in a life course perspective: Findings from the Aberdeen children of the 1950's cohort study. *Social Science & Medicine*, 66(4), 835-848.