

HEALTH EQUITY SERIES NO 20

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Expressions of context

Studies of schools, families, and health risk behaviours

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All men...from the most savage to the most highly civilized, act as they do act, first, because of variations in the circumstances of their environment, both physical and social.

Albion W. Small
(1905, p. 205)

Abstract

This thesis explores the health behaviours of young people. The main focus is on risk behaviours, i.e. those which may have adverse consequences for health. Two fields of interest are looked at. On the one hand, the thesis explores social determinants of such behaviours, with particular focus on the influence of schools' structural and social environments on health risk behaviours among youth. On the other hand, the thesis addresses the role of such behaviours in the relationship between childhood social inequalities and adult health. In terms of theory, the study sets out from James Coleman's view of the association between structure and agency and the assumption that macro level structures and patterns can be understood on the basis of individual actors' actions. The thesis consists of four studies addressing different, but related, aspects of the above areas of interest. The overall conclusion of Studies I-III is that the school context has direct and indirect effects on young people's risk behaviours. The results of multilevel analyses indicate, more specifically, that students who attend more advantaged schools report more risk behaviours such as smoking, alcohol- and drug use than students at more disadvantaged schools. Self-reported crime is however higher in the more disadvantaged school settings. Further analyses show that a school's social and normative climate also is important for the extent to which youth consume alcohol, smoke, or have used drugs. These risk behaviours are most prevalent in schools where a large proportion of the parents have a more permissive attitude towards alcohol and smoking, and where teacher-rated levels of trust and informal social control (collective efficacy) are high. The results show, further, that school contexts also act indirectly on youth risk behaviours. Young people who reports weak bonds with their parents tend generally to be more involved in risk behaviours than those who report strong bonds. This tendency is reinforced in more advantaged school settings. Finally, Study IV demonstrates that youth risk behaviours act accumulatively and indirectly on later health, rather than directly. Moreover, the importance of risk behaviours for later health varies between the birth cohorts. Health behaviours explain a larger part of the relationship between socioeconomic conditions in childhood and health as an adult in the younger cohort.

Sammanfattning

Hälsobeteenden har identifierats som en viktig mekanism bakom socioekonomiska skillnader i hälsa. I avhandlingen studeras hälsobeteenden hos unga. I fokus står riskbeteenden dvs. beteenden som kan tänkas ha negativa konsekvenser för hälsan. Intresset för hälsobeteenden är tudelat. Dels studeras socioekonomiska bestämningsfaktorer för sådana beteenden, i synnerhet betydelsen av skolans socioekonomiska- och sociala egenskaper. Dels studeras vilken roll sådana beteenden har för sambandet mellan socioekonomiska förhållanden i barndomen och hälsan som vuxen. Teoretiskt utgår avhandlingen från James Colemans syn på förhållandet mellan struktur och individ och antagande om att samhällsstruktur- och mönster kan förstås utifrån enskilda aktörers målinriktade/rationella handlingar. Avhandlingen består av fyra delstudier som behandlar olika, men relaterade, aspekter av ovan angivna intresseområden. Den övergripande slutsatsen av avhandlingens första tre studier är att skolkontexten har direkta och indirekta effekter på ungas riskbeteenden. Resultat från flernivåanalyser visar mer specifikt att förekomsten av unga som brukar alkohol, har provat droger eller röker är högre i resursstarka skolor. Den självrapporterade brottsligheten är dock högre i mer resurssvaga skolor. Fördjupade analyser visar att skolans sociala- och normativa klimat är betydelsefullt för ungas alkoholkonsumtion, rökning och för om de har provat droger. Dessa riskbeteenden är som mest förekommande i skolor där en stor andel av föräldrarna har en mer tillåtande inställning till alkohol och rökning och där den lärarskattade tilliten och informella sociala kontrollen (collective efficacy) är hög. Resultaten visar vidare att skolkontexten också verkar indirekt på ungas riskbeteenden. Unga som rapporterat svag bindning till sina föräldrar tenderar överlag vara mer engagerade i riskbeteenden än de som rapporterar stark bindning. Denna tendens förstärks ytterligare om de går i resursstarkaskolor. Slutligen, avhandlingens fjärde studie visar att riskbeteenden i ungdomen verkar kumulativt och indirekt på den framtida hälsan snarare än direkt. Betydelsen av riskbeteenden varierar vidare mellan kohorter, i detta fall, personer som är unga i två olika decennier. Mer specifikt visar resultaten att hälsobeteenden förklarar en större del av sambandet mellan socioekonomiska förhållanden i barndomen och hälsan som vuxen i den yngre kohorten. I den avslutande diskussionen diskuteras resultaten utifrån Colemans graf.

List of publications

- I Olsson, G., & Fritzell, J. (2015). A Multilevel Study on Ethnic and Socioeconomic School Stratification and Health-Related Behaviors Among Students in Stockholm. *Journal of School Health, 85*: 871–879.
- II Olsson, G., & Fritzell, J. (2016). Family Composition and Youth Health Risk Behaviors: The Role of Parental Relations and the School Context. *Child Indicators Research*, 1-19.
- III Olsson, G., & Modin, B. School-level (dis)advantage and Adolescents' Health Risk Behaviours: The Role of School Collective Efficacy and Norms. (Submitted).
- IV Olsson, G., & Fritzell, J. A Cohort Study Exploring the Role of Health Behaviours in the Association between Socioeconomic Childhood Circumstances and Midlife Health (Manuscript).

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Introduction

Health follows a social gradient; generally, the lower the status or position in the social hierarchy the higher the risk of death and ill-health (Marmot, 2004). The association has been found to hold in relation to most major causes of ill health (Erikson & Torssander, 2008). Many studies have shown that aspects of one's socioeconomic circumstances, no matter if these are measured in terms of educational level, income and/or social class, are related to health (Erikson & Torssander, 2008; Fritzell & Lundberg, 2007; Geyer, Hemström, Peter, & Vågerö, 2006; Wilkinson & Pickett, 2007). Thus, it is a general and commonly accepted finding that the socioeconomic circumstances in which people live their lives are closely related to their health (Marmot, 2004).

However, to gain an understanding of how socioeconomic differences in health arise, it is not sufficient merely to establish that there is a relationship between the two (Hedström, 2005); the mechanisms and processes underlying this relationship need also to be understood, i.e. *how* socioeconomic circumstances are transferred into health. Given the large amount of public health literature which addresses the social determinants of health, such mechanisms and processes have been operationalised and tested relatively little (McDaniel, 2013). One well-recognised pathway between socioeconomic position and health is the influence of health behaviours. Recent studies suggest that the explanatory power of the behavioural pathway is even stronger today than it has been in the past (Mackenbach, 2012), with these types of behaviour becoming increasingly important determinants of disease as well as stronger markers of class and identity (Cockerham, 2005; Mackenbach, 2012; Pega, Blakely, Carter, & Sjöberg, 2012).

We have a good understanding of the important behavioural risk factors for diseases and how these are distributed in the population. However, we know less about how these behaviours arise and how social conditions surrounding the individual translate into healthy or unhealthy behaviours. As recognised by Frohlich and Abel (2014), this is in a sense understandable, given the fact that epidemiology is the study of the determinants and distribution of disease, rather than one that seeks to understand why gradients exist and how behaviours arise. Nevertheless, this suggests that new research and other type of research models are needed to learn more about the emergence of health behaviours and further explore the behavioural pathway to health.

In more recent social epidemiological models it has been recognised that sociological theories may be helpful in the process of better understanding how socioeconomic circumstances relate to health and health behaviours. Studying how aspects of structures relate to behaviours (or vice versa) has a long tradition in sociology. This tradition includes studies of behaviours that are closely related to wellbeing and health, such as suicide (Durkheim, 1897) and lifestyle (Weber, 1914). The present thesis takes its theoretical departure in James Coleman's (1990) view of this association. According to Coleman an understanding of structure must be rooted in an understanding of individuals' actions and intentions (further discussed on p.24). The current study draws on his ideas to study possible pathways and processes to inequalities in health. By adding traditional sociological research and models to epidemiological concerns of today, this thesis aims to add new perspectives and learn more about how structure relates to agency in the field of health inequality research.

Aim and research questions

In a very broad sociological sense the overall ambition of this work is to explore how people's choices and actions relate to the structures in which they are embedded. Expressed in terms of public health, this work explores how socioeconomic differences in health arise and the role of health behaviours in this process. The interest in health behaviours is twofold. Firstly, the emergence of such behaviours is explored (i.e. how individuals' social conditions are translated into healthy or unhealthy behaviours). Here, there is special focus on how the structural and social characteristics of schools influence the health behaviours of youth. Secondly, the role of such behaviours on the pathway from social conditions in childhood to adult health is addressed from a life course perspective. Ideas stemming from analytical sociology, sociological theories and more recent epidemiological models have guided the work. The more specific aims have been:

- To examine whether/how, structural and social conditions at school are linked to health behaviours among young people (Studies I, II, III).
- To explore how schools' structural conditions interact with social and socioeconomic conditions in the family in generating health behaviours among young people (Study II).
- To estimate the extent to which the association between childhood socioeconomic circumstances and adult health is mediated by health behaviours established in youth, and whether this association differs across birth cohorts (Study IV).

Background

This chapter aims to embed the concepts of the thesis in the broader scientific discussions and relevant theories of the field. It begins with a brief overview of the most central concepts of the thesis. These concepts are then brought together in a theoretical model to illustrate the ways in which they relate to each other.

Health inequalities

Health inequalities exist in relation to all dimensions of socioeconomic status. Typically, markers of social disadvantage are associated with a higher risk of ill health in a dose response way: the lower the position, the worse the health. This association has been found to hold not only across different dimensions of social disadvantage and at different contextual levels, but also across life stages, historical times and countries. Link and Phelan (1995) have suggested that SES should be regarded as a fundamental cause of health, in the sense that no matter what the actual health threat may be, higher SES individuals and groups will usually always be better equipped in terms of resources to deal with the situation and to act in health-enhancing ways.

However, occupying a particular class position or having low educational status does not cause ill health in the same direct manner as exposure to agents of infectious disease. Instead, the resources associated with a particular position are linked to causally more proximate pathways that “help” to transform one’s social position into health (Bartley, 2004; Bourdieu, 1990; Link & Phelan, 1995; Marmot, 2004; Townsend, Davidson, & Whitehead, 1986).

The literature on how “the social gets under the skin” often distinguishes between five types of explanation: the material, social selection, the psychosocial, the behavioural and the life-course explanation (Bartley, 2004; see also Mackenbach, 2012 for a similar but more detailed division; Townsend et al., 1986). Although expressed here as separate theories, they are not mutually exclusive. Rather, the different pathways implied by the theories are likely to act in combination, especially over the life-course, and together influence people’s health status (Bartley, 2004; Fritzell, Lennartsson, & Lundberg, 2007). Furthermore, as recognised by Kittel (2006), each pathway

can always be further elaborated and divided into smaller components, including more detailed pathways which explain the previous ones. However, according to Kittel (2006), a reduction to psychological and physiological states is unnecessary if the ambition is to explain social macro-phenomena such as health disparities. A mechanism that relates to individual human action is in such cases sufficient (Kittel, 2006).

Health behaviours

Health behaviours usually refer to actions that are seen as associated with developing or preventing particular diseases or conditions (Holman & Borgstrom, 2015). In epidemiological research, health-related behaviours are usually viewed as actions or practices that can be controlled by the individual him- or herself (Frohlich, Corin, & Potvin, 2001; Glass & McAtee, 2006). Health behaviours are seldom seen as having anything in common except that they improve or harm health (Cockerham, 2005). Such an individual-based focus stands in contrast to the more structural perspective that prevails in sociological research as well as some of the more recent epidemiological models (Cockerham, 2013; Frohlich et al., 2001). Here, behaviours are seen as the result of processes of social stratification and the unequal distribution of resources (Bourdieu, 1990; Phelan, Link, & Tehranifar, 2010).

From this viewpoint, health behaviours are never truly voluntary but are rather tied to resources and constraints that link individual preferred choices of action with various costs. This is not to say that individuals are completely constrained by structure, but choices are nevertheless associated with constraints which depend on the individual's socioeconomic circumstances. Where individuals have similar resources and face the same constraints, they are more likely to make similar choices. The societal distribution of resources and constraints is therefore important in explaining differences in people's behaviours. Commonly used stratification dimensions such as education, income and social class are also, separately and together, strongly empirically linked with various expressions of individual action (Breen & Rottman, 1995). A graph illustrating these ideas is presented in Figure 1.

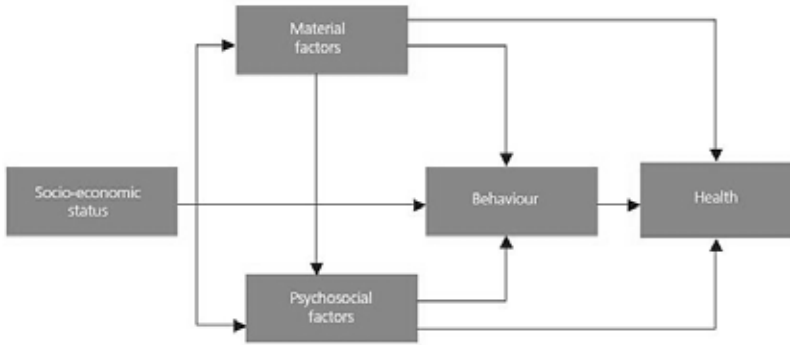


Figure 1. The role of health behaviours in the association between socioeconomic status and health (adapted from Mackenbach, 2006)

Thus, health behaviours are socially and economically patterned. As a result, they often cluster between individuals and social strata in the sense that people who smoke also tend to drink, and those who are physically active also tend to eat more healthily (Lynch, Kaplan, & Salonen, 1997). Poor health behaviours are typically more common in lower socioeconomic strata and settings. Individuals with less education, less income and lower social class as well as people living in poorer neighbourhoods (Macintyre & Ellaway, 2003; Mackenbach, 2006) are thus more likely to engage in health-risk behaviours than their less socially vulnerable counterparts. This pattern is most clear in the adult population. Among adolescents, the relationship between socioeconomic status and health behaviours is inconsistent or even contradictory (Due, Krølner, Rasmussen, Andersen, Damsgaard, Graham et al., 2011; Hanson & Chen, 2007; Johansen, Rasmussen, & Madsen, 2006; Tuinstra, Groothoff, Van Den Heuvel, & Post, 1998). It has been suggested that factors related to the school or the youth culture may be more decisive for the individual's development during this stage of life than the socioeconomic conditions of the family (West, 1997). Multilevel contextual analysis allows for the exploration of how characteristics of environments influence individuals, net of their individual and family background. In this type of analysis, it is recognised that individual development are influenced not only by the characteristics of individuals but also by characteristics of the environments in which they are embedded (Berkman & Kawachi, 2014).

Health behaviours from a contextual perspective

Even though there has been a great interest in research into social stratification and health, it tends to focus largely on the socioeconomic characteristics of the individual rather than on those of the contexts to which individuals are exposed (Macintyre, Ellaway, & Cummins, 2002). Still, socioeconomic status is a multilevel construct that needs to be considered not only as an aggregate of individual level conditions, but also as a characteristic of the environment that can act directly, and in combination with, individual level characteristics on individual level outcomes (Kawachi, Subramanian, & Almeida-Filho, 2002; Moore & Littlecott, 2015). Hence, social distribution occurs not only between individuals but also causes differences between aggregate units such as schools (Pickett & Pearl, 2001). In a sense, social stratification between individuals and between contexts is related. It is, for instance, obvious that the resources available to an individual will determine his or her range of choices regarding place of residence and related, choice of schools. Hence, resources on individual level also shape access to contexts that in turn are associated with more resources and benefits than other contexts. People with more resources are therefore also more likely to live in wealthy areas, with everything that this entails in terms of neighbourhood safety, public service and school quality. All these qualities are “add on” benefits that operate on contextual level, but are more likely to become available to people with greater individual level resources (Cockerham, 2013).

The mechanisms by which the characteristics of environments may influence behaviours are many. Theories focusing on social interaction processes, such as social contagion (Crane, 1991), social learning (Bandura & Walters, 1977) and/or social control models (Hirschi, 1969), have been used to explore such possible pathways. The general idea in these types of model is that environments are associated with norms and attitudes that are transmitted between individuals through social interaction. For the purpose of this thesis, however, these models are not sufficient as they do not fully address why youth behaviours would be expected to vary between different settings in the first place (Ennett, Flewelling, Lindrooth, & Norton, 1997). A theory that does allow this issue to be addressed is the Social Disorganization Theory (Shaw & McKay, 1942). Social Disorganization Theory (SDT) has long been recognised as a fruitful framework for studying social stratification at the aggregate level. The general idea of SDT is that structural disadvantage impairs processes of informal social control. This in turn make disadvantaged setting less able to control the influence of subcultures and different types of problem behaviours. Thus, rather than acting directly on behaviours, the socio-demographic components of settings regulate behaviours by enforcing patterns of social control (Sampson, Raudenbush, & Earls, 1997). By regulating the efficiency of control functions, the socio-demographic charac-

teristics of settings make certain behaviours easier to adopt than others, with the general assumption being that constraints against unhealthy behaviours are less common or impaired in socio-economically disadvantaged settings (Shaw & McKay, 1942).

Health behaviours and the school context

It is in the context of the family that individuals first learn the attitudes, behaviours and values. Even though the family clearly constitutes the main socialising agent during early life, development is the result of a complex number of factors on different societal levels (Singh-Manoux & Marmot, 2005). Hence, the influence of arenas outside that of the family must be taken into consideration if we are to gain a broad understanding of youth development. Bronfenbrenner (1981) describes individuals as embedded in multiple social contexts that not only exert direct effects, but also interact with each other in their influence on individual development. The school is one such central context in young people's lives. Given the many hours spent in this setting every day for many years it is important to recognise the potential influence that the school may have on young people's development. The official role of school is to transmit knowledge and skills from one generation to another. However, school also plays a significant role, in shaping young people's values, beliefs and opportunities (Singh-Manoux & Marmot, 2005).

Adolescence is a stage in life when many health behaviours are adopted but also a period characterised by experimentation with behaviours and identities. The engagement in behaviours is often away to signal self-image, group belonging and independence from parents (Jessor, 1991). The social and symbolic meanings ascribed to behaviours in different settings have been shown to be central to youth decision to engage (or not) in behaviours (Stead, McDermott, MacKintosh, & Adamson, 2011). For youth, such social and symbolic meanings are often just as important, or even more important, than concerns about the possible long-term effects on health of the behaviours in question. In settings where unhealthy behaviours are associated with desirable values, engagement in such behaviours may seem perfectly rational in order to gain status or avoid peer rejection or other social risks (Jessor, 1991). Meanings ascribed to behaviours and influences stemming from the school environment may thus be particularly important for behaviours adopted during this phase in life (Johansen et al., 2006).

As with other settings, the socio-demographic characteristics of schools are, from the point of view of SDT (Shaw & McKay, 1942), not assumed to act directly on youth behaviours. Rather, the characteristics of schools are believed to activate mechanisms and social processes, related to trust and informal control, which regulate young people's engagement in different

types of behaviour (Bradshaw, Sawyer, & O'Brennan, 2009). The more heterogeneous composition of students and the greater mobility that often characterise disadvantaged schools may, for instance, weaken social networks and make informal control functions less effective. In such settings, agreement about appropriate behaviours may thus be hard both to establish, uphold and to control. This will (theoretically) make these types of school setting more vulnerable to various types of subculture and problem behaviours. Conversely, such circumstances are also likely to affect individual students' values and their assessment of what are acceptable and desirable behaviours.

Research into the effects of school has hitherto mainly looked at the influence of the school environment on educational outcomes. However, an increasing number of studies also show that schools have an effect that goes beyond that of individual level characteristics, affecting many other types of outcome, including health behaviours. Generally, as might be expected, most of the variation in the outcome in question can be attributed to individual-level characteristics. However, a not inconsiderable amount of variation can also be attributed to differences between schools (Bonell, Parry, Wells, Jamal, Fletcher, Harden et al., 2013; Sellstrom & Bremberg, 2006). Research into school effects further suggests that such effects can be both direct and indirect, with the latter suggesting that school characteristics may also moderate the effects of factors such as poor home conditions (Eklund & Fritzell, 2013; Hoffman & Dufur, 2008).

Health behaviours from a longitudinal perspective

Many of the health behaviours that are initiated in adolescence have important future consequences for young people's health and wellbeing (Catalano, Fagan, Gavin, Greenberg, Irwin, Ross et al., 2012; Viner, Ross, Hardy, Kuh, Power, Johnson et al., 2015). Life course epidemiology offers a theoretical lens through which such influences can be investigated and understood. In broad terms, life course studies are concerned with the long-term influence on later health of physical or social exposures during different stages of life, especially childhood and adolescence (Kuh, Ben-Shlomo, Lynch, Hallqvist, & Power, 2003). Four broad models are usually distinguished when describing how such exposures operate on later health. The Critical Period Model proposes that exposures during specific periods of rapid development may have long lasting, unique, non-modifiable influences on the structure or functioning of organs, tissues or body systems. The Sensitive Period Model is an extension, or weaker version, of the Critical Period Model, in the sense that it recognises that later exposures may modify the effect of the original exposure. The Accumulation of Risk Model assumes that risks accumulate over the life course. The exposures may depend on some common factor – like socioeconomic status or personality – or may be

independent, but the overall assumption is that the cumulative disadvantage increases with the number, duration and severity of the exposures. Finally, the Chain of Risk Model suggests that exposures are linked to one another in the sense that one exposure (in a probabilistic way) leads to the next and that these exposures additively or through triggering effects influence later outcomes (Kuh & Ben-Shlomo, 2004; Wadsworth & Kuh, 2016).

When applied to youth health behaviours, all of the above-mentioned pathways are theoretically plausible. Adolescence is generally seen as a sensitive period characterised by major developments in terms of biological, social, behavioural and relational changes (Viner, Ozer, Denny, Marmot, Resnick, Fatusi et al., 2012). In fact, apart from fetal and infant life, the rapidity of growth and change in adolescence is greater than during any other phase in life. Viner (2015) points to the possibility that the adolescent period may also be a critical or sensitive period for later health and disease in traditional life course terms. Thus, it may well be that exposures during this period in life make imprints which have major direct implications for later health. For example, glue sniffing in adolescence could be directly linked to later health irrespective of later circumstances or behaviours. It is also feasible that poor health behaviours in adolescence influence later exposures (e.g. substance use, school failure and delinquency) in a cumulative manner, resulting in long-term health consequences (Kuh & Ben-Shlomo, 2004; Kuh et al., 2003).

The overall empirical evidence suggests that health behaviours initiated in adolescence tend to be maintained into adulthood (Abdalla, Raeside, Barker, & McGuigan, 1997; Catalano et al., 2012; Marshall, 2014). Evidence of such tracking has been found for more or less all important health behaviours. Smoking and alcohol behaviours, for instance, track strongly into adult life, whereas the tracking of physical inactivity and diet is more moderate (Due et al., 2011). However, although evidence is fairly consistent with regards to the tracking of youth health behaviours, the pathways between adolescent and adult behaviours is not well understood.

Findings also suggest that the tracking of health behaviours may be socially differentiated, with youth from lower socioeconomic conditions at higher risk than those from more advantaged backgrounds of continuing adverse behaviours into adulthood and of these behaviours having more severe consequences (Due et al., 2011). Socially differentiated tracking has been found for smoking and physical inactivity. The evidence of alcohol use being socially patterned is less consistent (Due et al., 2011) or non-existent (McCambridge, McAlaney, & Rowe, 2011). Thus, resources may buffer the risks and reduce the potential consequences of youth alcohol consumption, but do not seem to remove them (McCambridge et al., 2011). Studies of social patterning of vulnerability and the consequences of adverse health behaviours are, however, scarce. Those which are available indicate, in line with what is suggested by the accumulation model, that the consequences of

these behaviours may become more severe than otherwise when adverse behaviours cluster with other risk factors. However, more research into this has been called for (Due et al., 2011).

Health behaviours have also been found to cluster during adolescence, in the sense that engagement in some behaviours often leads to engagement in other, related behaviours (Jackson, Sweeting, & Haw, 2012; MacArthur, Smith, Melotti, Heron, Macleod, Hickman et al., 2012; Wiefferink, Peters, Hoekstra, Dam, Buijs, & Paulussen, 2006). Such clustering has been found to be stronger for health risk behaviours like smoking, alcohol use, substance use and risky sexual behaviour than for health enhancing behaviours such as safe sex and healthy diet (Wiefferink et al., 2006). Regular alcohol use and binge drinking, in particular, are strong predictors of engagement in other forms of risk behaviour during adolescence (MacArthur et al., 2012). Engagement in multiple health risk behaviours is, in turn, associated with increased morbidity and premature mortality (MacArthur et al., 2012). Risk behaviours, in particular those with early onset, have also been linked to later consequences in the form of poorer health outcomes, social problems and early death (Green, Leyland, Sweeting, & Benzeval, 2013; McCambridge et al., 2011). Moreover, data from the Global Burden of Disease study suggest that many of the behaviours that are initiated in adolescence can be found among the top ten risk factors for disease in young adulthood (Marshall, 2014).

In conclusion, it is sometimes claimed that engagement in risk behaviours in adolescence is part of a normal developmental pattern at a time of life when experimentation is common. Nevertheless, the overall empirical evidence suggests that experimentation with such behaviours result in a higher risk of later alcohol misuse, continued smoking, impaired health and many other consequences than if no such experimentation had taken place – especially among the already vulnerable.

Health behaviour as a causal regularity

A major characteristic of individual behaviour is that it has regular features (Demeulenaere, 2011). This regularity forms the basis of social life and underpins all social interaction. The regularity of behaviours is a central aspect of any kind of purposive action, i.e. action that is directed at a predictable outcome of some kind (Demeulenaere, 2011). It is the regularity of actions that makes it possible to foresee and anticipate the outcomes of behaviours, not only at individual but also at aggregate level. Rather than individual behaviours per se, it is these types of regularity and similarity that are the focus and concern of sociological studies (Breen & Rottman, 1995).

The distribution of resources is thus not only essential for individual people's actions; it also has important implications for the actions of groups of

people. Individual choices made by people with similar resources, preferences and constraints give rise to these types of “aggregate regularities” which are much more predictable of behaviours than single individual events (Breen & Rottman, 1995). The distribution of resources acts in two ways on people’s behaviours. On the one hand, it shapes the objective conditions and constraints that people act under, and in so doing also determines the possibilities available to people in similar social positions. On the other hand, it shapes people’s perceptions of their objective conditions (Breen & Rottman, 1995). As recognised by Bourdieu (1990), people with similar resources or forms of capital gain common experiences and thereby also common interests, perceptions and habits. This makes them more likely to act in similar ways. There is of course always a unique component to individual experience, but among people with similar forms of capital it is still possible to distinguish group-specific ways of perceiving the world, which in turn affect their actions (Azarian, 2007).

Understanding the characteristics of individual health behaviours may thus also be a way to gain a greater understanding of the social processes and the social properties that emerge from them. The idea can be traced back to Weber’s view that causal explanations are inadequate unless they are also combined with an understanding of the actions of individuals (Weber, 1914). Making individual actions the basis from which social facts can also be understood corresponds well with the basic principles of analytical sociology and methodological individualism.

Analytical sociology is concerned with traditional sociological interests, such as the emergence of norms, collective behaviours and inequalities, but it uses explanatory strategies that relate to activities (Hedström, 2005). The core idea is that all kinds of social life involve individual actors; any explanation of the social world therefore must refer to these actors and their actions (Demeulenaere, 2011). However, analytical sociology, with its focus on activities, does not advocate that sociological studies should concern themselves with the actions of individuals. Rather, an understanding of the actions of individuals is seen as a necessary step towards understanding the social processes emerging from them (Hedström, 2005). A proper explanation entails detailing the “cogs and wheels” (Hedström, 2005 p.3) of the process, i.e. revealing the mechanisms at work. This usually involves using explanatory strategies that relate to activities and entities, typically actors and their actions.

Coleman's boat

Coleman's work is closely related to analytical sociology and has profoundly influenced this approach. Coleman also sees the social system as an emergent consequence of the interdependent actions of the actors that make up the system. An understanding of system behaviour must thus be grounded in an understanding of individuals' actions and intentions (Coleman, 1986). Coleman has summarised his ideas in the well-known micro-macro graph commonly known as *Coleman's boat* (Figure 1).

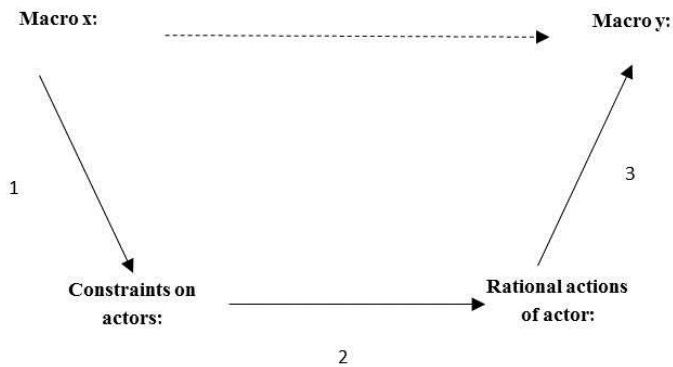


Figure 2. Coleman's boat

The graph illustrates in a simple way how social properties, relate to each other. In order to properly explain the association between social properties, three steps need to be taken. Firstly, a path from an independent variable characterising a macro-level property to a dependent variable characterising the individual should be established. This step from macro to micro is referred to as Relation 1 and describes how circumstances at the macro-level influence individuals' disposition to act (e.g. through their beliefs, preferences and values). Secondly, an individual-level path between the independent and the dependent variables should be identified (Relation 2). This entails trying to make explicit the mechanisms that connect individuals' preferences to their actions. Thirdly, a path between the dependent variable characterising the individual and the dependent variable at the macro-level should be demonstrated (Relation 3). The aim should be to clarify how individual actions bring about the particular macro level outcome under study.

Relation 3, or the transfer from micro to macro level, is generally considered to be the most challenging one. One of the problems is the lack of theories that can be used to satisfactorily link existing macro and micro theories to each other (Sawyer, 2011). A second problem is related to the lack of data allowing us to empirically explore the theorised link. The simplest ways of accounting for the emergence of social properties is to view the macro level outcome simply as the sum of individual actions, without specifying which combinations or aggregations brought about the development. Even though this is a common mode of procedure, the transfer from micro level behaviour to macro level properties is generally seen as more complicated than that, and a simple aggregation of individual behaviour is usually not considered sufficient. For example, interaction between individuals will sometimes result in emergent phenomena at the system level that were neither intended nor predicted by the acting individuals (Coleman, 1990). To properly account for the growth or occurrence of any social property it is, according to Coleman (1990), necessary also to consider the interdependence of individuals' actions.

With individuals' actions and intentions viewed as the foundation of the social system, theories of action become fundamental. Coleman argues that a simple theory of purposive action would in many cases constitute a sufficient micro-foundation for the advocated social theory. Given the complexity of the theory, involving phenomena at different analytical levels, he considers it important (and an advantage) that the individual-level component should remain simple (Coleman, 1990). Moreover, the type of action theory required should be psychologically and sociologically plausible and capable of explaining action in meaningful intentional terms (Coleman, 1990). Based on these ideas, Hedström (2005) has proposed the Desire-Belief-Opportunity theory (DBO-theory) of action as an appropriate foundation for the model. According to DBO-theory, all intentional actions carried out by individuals can be explained by their desires, beliefs and opportunities. These components are the product of social interactions between individuals or between one individual and a social aggregate. Beliefs and desires are mental events that cause action by providing reasons for the actions, while opportunities regulate the available options for action. Together these components form the most proximate causes of individual's actions (Hedström, 2005).

Conceptual model and outline of thesis

Adopting a similar approach, the present study explores health behaviours as a possible mechanism which links social stratification to population health. To illustrate and summarise the ideas sketched out in the background and link them to the topic of the current study, a conceptual model that draws on the work of Coleman has been devised.

To explain the association between social stratification and population health it is not, according to Coleman's graph, sufficient merely to establish a relationship between the two macro factors. Rather, it is crucial to reveal the mechanisms and processes underlying this relationship, i.e. how socioeconomic circumstances are transferred to health. The objective of this thesis is to explore empirically the role of health behaviours in this process, using Coleman's ideas as the framework of guidance. The relations addressed are summarised in Figure 1:

1. Social stratification generates certain distributions of various forms of capital/resources and values across families and schools.
2. Individuals with certain values and resources adopt certain kinds of orientations to health behaviours
3. Certain orientations to health behaviours help bring about health disparities in a society.

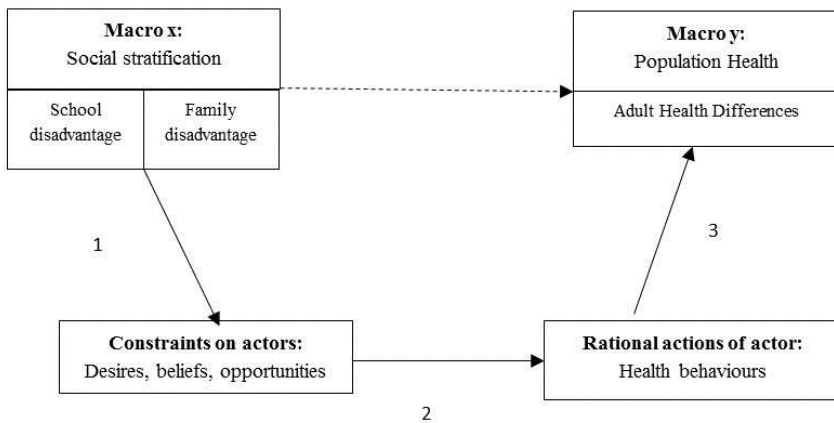


Figure 3. Conceptual model adapted from Coleman (1990)

In Studies I to III (as illustrated by arrows 1 and 2), the aim was to identify processes through which aspects of social stratification, here operationalised as school and family socioeconomic disadvantage, can put constraints or incentives on actors (arrow 1). A further aim was to identify how this in turn may influence actors' orientation to action, here understood as their propensity to engage in health impairing or enhancing behaviours (arrow 2). Ideas stemming from DBO-theory are used to understand how aspects of structure may influence individual action. An unequal distribution of resources and

socialisation processes taking place in the family and school context is seen as central in linking aspects of structure to the individual's disposition to act. Moreover, plausible mechanisms linked to theories of social control (collective efficacy, parental indirect social control) and norms that may constrain individual action are examined. Study IV focuses on arrow 3 in Figure 3. Here, the extent to which individuals' health behaviours help to account for health disparities is explored by applying a life course perspective to the significance of childhood socioeconomic circumstances and youth health behaviour for health disparities in mid-life. These associations are explored across cohorts. The aim was to explore whether the mediating role of health behaviours changes between cohorts potentially exposed to different social norms and patterned knowledge about health behaviours.

Notes on data and methods

In this section, methodological considerations, choices and concerns pertaining to the four empirical studies of the thesis are discussed. What data has been used? How were the variables operationalised? What methods were used? Which questions were answered and which were not? These questions, and in particular the decisions associated with them, influence the answers received. It is therefore essential to give an account of some of the more specific decisions that were taken during the course of writing since they have, in many ways, shaped the foundations of this thesis.

Data material

The empirical analyses in Studies I and II are based on data from 9th grade students who participated in the 2010 wave of the Stockholm School Survey. This survey covered questions about social relations, various expressions of externalising and internalising problems, social background as well as questions about the school climate and the perceived school situation as a whole. In its current form, this survey has been carried out biennially since 2000 among all 9th and 11th grade students in Stockholm municipality. Participation is mandatory for all publicly funded schools and voluntary for independent schools. The survey is distributed in the classroom by the teacher and the completed questionnaires are returned in sealed envelopes. All students present on the day of the survey are asked to participate during a regular lesson (Stockholm Office of Research and Statistics, 2010; Svanberg, 2008). Study III is based on data combining information from the 9th grade students who participated in the 2014 wave of the Stockholm School Survey with information from the Stockholm Teacher Survey conducted the same year. The 2014 Teacher Survey was carried out among all teachers working in senior-level schools in Stockholm municipality (n=1952), using a web-based questionnaire. Its main purpose was to collect information about the learning, working and social environment in Stockholm schools. A total of 1,288 teachers responded, giving a response rate of 66 percent.

Table 1 presents an overview of the population and the participating schools and students in the Stockholm School Survey. According to the National Agency for Education (Skolverket 2010, 2014), the total number of schools with 9th grade students in Stockholm municipality (excluding spe-

cial schools) was 117 in 2010 and 124 in 2014. In Studies I and II, all public schools and 72 percent of all independent schools participated in the survey. External attrition of schools is due to non-participating independent schools. Student attrition is due to absence from school the day of the survey and internal non-response due to unreliably filled-in questionnaires. For the final sample in Studies I and II, schools with less than 10 students, schools that lacked the required information and students with internal attrition in relation to any of the included variables were excluded. This procedure resulted in a final sample representing 97 percent of all public schools and about 55 percent of the independent schools in Stockholm municipality. In Study I, 69 percent of all public school students and 49 percent of all independent school students participated. The corresponding figures for Study II are 63 and 44 percent.

In Study III the procedure differed somewhat because it also matches the schools participating in the Stockholm School Survey with the schools participating in the Stockholm Teacher Survey. In this study the survey sample represents 92 percent of all the public schools and 33 percent of the independent schools in Stockholm. External attrition is due schools not participating in at least one of the surveys. For the final sample, one school that lacked the required information and respondents with internal attrition were excluded, giving a final sample representing 92 percent of all public schools and 32 percent of all independent schools. Seventy-six percent of students at public schools and 27 percent of students at independent schools in Stockholm municipality are represented.

Table 1. The population of schools and students in Stockholm municipality 2010 and 2014 and an overview of the study samples in Study I-III.

	Study I Year:2010		Study II Year:2010		Study III Year:2014	
	Students (%)	Schools (%)	Students (%)	Schools (%)	Students (%)	Schools (%)
Population	8592	117	8592	117	7963	124
Public	6274	67	6274	67	5440	67
Independent	2318	50	2318	50	2523	57
Survey sample	6622 (77)	103 (88)	6622 (77)	103 (88)	5122 (64)	81 (65)
Public	5152 (82)	67 (100)	5152 (82)	67 (100)	4375 (80)	62 (92)
Independent	1470 (63)	36 (72)	1470 (63)	36 (72)	747 (30)	19 (33)
Final sample	5484 (64)	93 (79)	5002 (58)	92 (78)	4849 (61)	80 (64)
Public	4348 (69)	65 (97)	3968 (63)	65 (97)	4157 (76)	62 (92)
Independent	1136 (49)	28 (56)	1034 (44)	27 (54)	692 (27)	18 (32)

Study IV made use of information from several waves of the Swedish Level of Living Survey (LNU), conducted at the Swedish Institute for Social Research (Swedish Institute for Social Research, 2016). The LNU is a comprehensive database for analyses of the level of living of the Swedish popu-

lation. The survey provides information about a wide range of dimensions, including health, childhood conditions, spare time activities, family circumstances, work environment and employment. The survey is based on face-to-face interviews with a random and representative sample (1/1000) of the Swedish population between the ages of 15 and 75 (Johansson, 1973). In 1991 the lower age limit was raised to 18. The survey was first carried out in 1968 and has been repeated five times since then (1974, 1981, 1991, 2000 and 2010). The overall response rate was 90.8 percent in the first wave, but has since then declined. The survey has a panel design but each survey also includes new, younger generations and immigrants in order to retain cross-sectional representativeness (Fritzell & Lundberg, 2007). The panel consists of about 1,000 individuals who have been interviewed in all six waves of the study. In Study IV, two birth cohorts (1948-53 and 1961-66) in the panel were followed. Individuals aged 15-20 at baseline, i.e. in 1968 for the older cohort and in 1981 for the younger, were selected and followed up in 1991 and 2000, respectively. The total panel attrition was 72 percent. The drop out was slightly higher for cohort 2 (31 percent) than for cohort 1 (24 percent).

Methods

In Studies I-III, multilevel analysis was used to assess the impact of the schools' structural and social environments on youth health behaviours. In Study I, logistic-random-intercept models were used, accounting for the dichotomous outcome variable. The outcome variables in Studies II and III are continuous, making random intercept and fully random linear regression models possible. Multilevel modelling is the most appropriate analytical method in cases where data is hierarchically structured, such as in the case of students being nested within schools. By using multilevel methods that take the clustered structure of the data into account, underestimated standard errors are avoided. Furthermore, by taking the nested structure of the data into consideration, multilevel analyses make it possible to separate the effects of lower and higher-level units. These models also allow for the inclusion of predictor variables on more than one level, making it possible to explore how variation is distributed between analytical levels. It also facilitates analysis of how specific characteristics of higher units influence individual-level outcomes while holding constant the effect of individual level characteristics (Snijders & Bosker, 1999). A central aim of Studies I-III is to distinguish the effects of school from those of individual students. This distinction serves the purpose of separating "compositional" and "contextual" effects, i.e. effects originating from the "variability in the constitution of the groups" from effects of the context that acts "above and beyond differences that exist in group composition" (Johnson, 2010 p.617). In research there has traditionally been a greater tendency to attribute variations between settings to compo-

sitional rather than contextual differences. A contributing factor has been the fear of committing the ecological fallacy, i.e. drawing conclusions about the relationship at the individual level based on how the relationship looks at a higher abstraction level (Macintyre & Ellaway, 2000; Robinson, 1950). However, the ability to simultaneously include individual and group level characteristics in multilevel models has generated greater confidence in contextual analyses today compared with two decades ago. Finally, multilevel models provide a means for accurately investigating cross-level interactions, thereby testing whether contextual effects vary between groups of people, and whether contextual features can modify the influence of individual characteristics on a certain outcome (Snijders & Bosker, 1999). This is a central aim of Study II.

The ambition of Study IV is to explore pathways from childhood socioeconomic conditions to adult health and the role of health behaviours in this association. Path analysis allows for simultaneous modelling of several related variables across time. It was therefore, given the purpose of the study, deemed to be an appropriate statistical method to use. Path analyses are part of the family of structural equation models. Briefly, these models consist of a measurement part and a structural part, with path models constituting the structural part when single-indicator variables are modeled. When the variables in the model are latent (measured by multiple observed indicators), path analysis is termed structural equation modelling. However, as in the case of Study IV, when single-indicator variables are analysed, the models are usually referred to as path analysis. Path analysis can be seen as an extension of the regression model. Instead of one regression it contains a system of equations performed simultaneously to test the fit of a hypothesised model against an observed correlation matrix (Bollen, 1989). Causal diagrams or path diagrams are often used to illustrate assumptions made about relationships between covariates (Acock, 2013; Bollen, 1989). Two features of path analysis have been central to this study. First, path analyses allow for effect decomposition. In other words, it is possible to separate and test direct, indirect and total effects. The decomposition is based on the rule that in a linear system (all associations between variables in a path diagram are assumed to be linear) the total causal effect of variable x on variable y is the sum of the values of all the paths from x to y (Bollen, 1989). Secondly, standard linear path models also allow for group comparisons, thus making it possible to compare and test path estimates across groups, which is a central aim of Study IV.

Measures

The following section provides an overview of the most central concepts in the thesis, the origins of these concepts and how they have been operationalised.

Family socioeconomic disadvantage

Societies are stratified in multiple ways. These multiple dimensions of stratification are important mechanisms through which resources are distributed in populations (Grusky, Ku, & Szelényi, 2001; Oakes, 2006). Important structuring dimensions are class, education, income and ethnicity (Breen & Rottman, 1995). These dimensions are related to different resources and will thus, in a sense, emphasise different aspects of social stratification. The fact that these dimensions are strongly correlated also suggests that they are manifestations of the same underlying pattern of social stratification in society (Oakes, 2006). Based on this idea of there being a common underlying factor of socioeconomic stratification, family socioeconomic disadvantage is used as a generic term in this thesis. The term refers to the social and economic dimensions of stratification that, individually and jointly, influence which position an individual holds in the structure of society. The included items differ somewhat and are treated differently in the individual studies, but the aim is always to capture the underlying dimension of socioeconomic disadvantage rather than the specific pathways of each indicator. In a sense this conceptualisation refers to a type of latent construct that is assumed to capture a broader dimension, related to resources, attitudes and overall social position – not only income or education per se. An overview of how the concept was operationalised can be found in Table 2.

School disadvantage

Societies are stratified not only along multiple individual dimensions but also on multiple levels. Socioeconomic status can thus also be seen as a multilevel construct, effective on different structural levels. As part of the surrounding society, schools – just like individuals – are stratified along a variety of socioeconomic dimensions that influence their character and the position they hold relative to other schools (Skolverket, 2012a). In Sweden, parental education, ethnicity and student achievement have been recognised as central dimensions in the stratification of schools (Gustafsson, 2006). To capture their socioeconomic character, a combination of objective measures from registers, aggregated measures and subjective measures based on individuals' reported perceptions of the school environment have been used. These have been treated and combined in a variety of ways in the present studies. The common aim was however, to identify the socioeconomic as-

pects of schools that either empirically (Gustafsson, 2006; Skolverket, 2012b) or theoretically (Shaw & McKay, 1942) can be assumed to capture (socioeconomic) school disadvantage in Sweden. A common problem in research into contextual effects is that it often lacks a theoretical foundation. To avoid this, and to facilitate theoretical and analytical understanding, efforts were made to include theoretically based variables in the empirical studies of this thesis. A more detailed description of the variables can be found in Table 3.

Table 2. Operationalisation of family socioeconomic disadvantage in Studies I-IV

Study	Items	Question (cohort 1/cohort 2)	Operationalisation (cohort 1/cohort 2)
Study I	Parental education ^a	Mothers resp. fathers highest level of education? ^a	(a) (0) Compulsory school (1) Upper secondary school (2) University (3) Don't know
	Time lived in Sweden ^b	How long have you lived in Sweden? ^b	(b) (0) All my life (1) 10 years or more (2) 5 to 9 years (3) Less than 5 years
Study II	Family composition ^c	Which people do you live with? ^c	(c) (0) Do not live with both parents (1) Live with both mother and father
	Parental education ^a	Mothers resp. fathers highest level of education? ^a	(a) (0) At least one parent with a university education (1) Less than university or don't know
Study III	Time lived in Sweden ^b	How long have you lived in Sweden? ^b	(b) (0) Lived in Sweden all my life (1) Have not been living in Sweden all my life
	Family composition ^c	Which people do you live with? ^c	(c) (0) Live with both mother and father (1) Do not live with both parents
	Parents' employment status ^d	What do your parents do? ^d	(d) (0) Both parents working (1) At least one parent unemployed
	Parental education ^a	Mothers resp. fathers highest level of education? ^a	(a) (0) Less than university or don't know (1) At least one parent with a university education (2) Missing
Study IV	Time lived in Sweden ^b	How long have you lived in Sweden? ^b	(b) (0) Lived in Sweden all their lives (1) Have not been living in Sweden all life (2) Missing
	Family composition ^c	Which people do you live with? ^c	(c) (0) Live with both mother and father (1) Not living with both parents
	Parents' employment status ^d	What do your parents do? ^d	(d) (0) Both parents employed (1) At least one parent unemployed
	Parental education ^a	Does your father have any education above elementary school? ^a	(a) (0) No (1) Yes
Study V	Non-native parents ^b	Were both your parents Swedish citizen when you were born? ^b	(b) (0) No (1) At least one parent is a Swedish citizen
	Family composition ^c	Did you live together with both your biological parents during your whole upbringing? ^c	(c) (0) Yes (1) No
	Financial situation ^d	Did your family have severe financial difficulties during upbringing? ^d	(d) (0) No (1) Yes
Index: Childhood SES disadvantage			
The items were weighted using an inverse probability score before being summed to an index			

Table 3. Operationalisation of school disadvantage in Studies I-III

Study	Items	Question (cohort 1/cohort 2)	Operationalisation (cohort 1/cohort 2)
Study I	Share of parents with tertiary education	Register data	
	Share of students born outside Sweden or with parent born outside Sweden	Register data	
	School types		Dimensions combined into quartiles. One broad category covering 50 percent of all schools and 25 percent most or least disadvantaged
Study II	Share of parents with tertiary education	Register data	
	Share of students born outside Sweden or with parent born outside Sweden	Register data	
	Mean marks	Register data	
	Trust	I worry about being exposed to crime	
	School mobility	Have you changed school in the last 12 months?	
	Index: School advantage		Factor analyses of aggregate variables, merged to one variable using the factor scores
Study III	Share of parents with tertiary education	Register data	
	Share of students born outside Sweden or with parent born outside Sweden	Register data	
	Mean marks	Register data	
	Index: School advantage		Standardised items were added and divided by the number over which the sum was calculated

Health behaviours

The empirical evidence supports the existence of organised patterns of adolescent health behaviours (Kulbok & Cox, 2002; Wiefferink et al., 2006). The covariation is stronger for health risk behaviours than for health enhancing behaviours (Jessor, 1992; Wiefferink et al., 2006). Regular alcohol use and binge drinking, in particular, are strong predictors for engagement in other forms of risk behaviours during adolescence (MacArthur et al., 2012). However, not all risk behaviours cluster. A recent study (Bannink, Broeren, Heydelberg, van't Klooster, & Raat, 2015) did for instance identify a substance use cluster and a problem behaviour cluster (incurring debts, truancy and delinquency). Richard Jessor (1992) suggested that social ecology of adolescent life provides socially organised opportunities to learn risk and problem behaviours as well as normative expectations that they be performed together. He also stated that the clustering may indicate that these types of behaviours serve similar social and/or psychological developmental functions for adolescents, such as affirming individuation from parents, trying to achieve adult status, and seeking acceptance from peers. Following this view, health behaviours are treated together and viewed upon as a set of behaviours in all of the studies except in Study I. Such a perspective focuses on the individual as an actor rather than on the separate behaviours per se. The perspective also enables a more comprehensive and simultaneous concern of adolescents risk behaviours and the circumstances that give rise to them (Jessor, 1992). A detailed description of how the variables were operationalised can be found in Table 4.

Collective efficacy

Building on theories of social capital, collective efficacy is conceptualised as a feature of a setting that defines its conjoint capability for action to achieve common goals, such as public order or control of crime (Bruinsma, Pauwels, Weerman, & Bernasco, 2013). The willingness of local residents to intervene for common good is thought to largely depend on conditions of mutual trust. Thus, socially cohesive settings are seen as the most fertile contexts for the realisation of informal social control. The concept originates from neighbourhood research but has later also been applied to the school setting (Kirk, 2009). In line with these theoretical ideas, two different measures of school collective efficacy have been used. One measure derived and aggregated from student reports. The other derived and aggregated from teacher reports. A detailed description of how the variables were operationalised can be found in Table 5.

Table 4. Operationalisation of health behaviours in Studies I-IV

Study	Items	Question (cohort 1/cohort 2)	Operationalisation (cohort 1/cohort 2)
Study I	Alcohol consumption ^a	How often do you on the same occasion drink alcohol corresponding to...	(a) Less than once a month (1) Once a month or more
	Drug use ^b	Have you ever tried drugs ^b	(b) (0) No (1) Yes
	Delinquency ^c	How many times during the past 12 months have you stolen a car, forced someone to give you... (money, mobile or else of value), broken into (car, shop or other building), carried a weapon? ^c	(c) (0) Not committed (1) Committed
Study II	Alcohol consumption	How often do you on the same occasion drink alcohol corresponding to...	Standardised items were added and divided by the number over which the sum was calculated
	Drug use	Have you ever tried drugs?	
	Smoking	Do you smoke?	
Index: Health risk behaviours			
Study III	Alcohol consumption	How often do you on the same occasion drink alcohol corresponding to...	Standardised items were added and divided by the number over which the sum was calculated
	Drug use	Have you ever tried drugs?	
	Smoking	Do you smoke?	
Index: Health risk behaviours			

Table 4. cont.

Study	Items	Question (cohort 1/cohort 2)	Operationalisation (cohort 1/cohort 2)
Study IV	Smoking in adolescence ^a	Do you smoke cigarettes, a pipe or cigars?/Do you smoke? ^a	(0) Non-smoker (1) Smoker
	Alcohol consumption in adolescence ^b	Do you ever consume alcoholic beverages?/Do you sometimes drink wine, strong beer or liquor? ^b	(0) Do not consume (1) Consume alcohol
	Physical activity in adolescence ^c	Do you engage in any of the following leisure activities? ^c	(0) Yes, sometimes or yes, often (1) Less than so
	Diet in adolescence ^d	Is your vegetable intake in line with recommendations?/Do you generally include greens and vegetables in your diet? ^d	(0) In line with recommendations (1) Not in line with recommendations/(0) Yes (1) No
Index: Health behaviours in adolescence			
Study IV	Smoking in midlife ^a	Do you smoke? ^a	Standardised items were added and divided by the number over which the sum was calculated (0) Non-smoker (1) Yes, more or less than 10 cigarettes
	Alcohol consumption in midlife ^b	Do you usually drink more than a glass or two?/How much alcohol do you usually consume when you drink? ^b	(0) No (1) Usually more than a glass or two/(0) Less than three glasses of wine or equivalent (1) Three or more
	Physical activity in midlife ^c	Do you pursue any sports, outdoor or exercise activities? ^c	(0) Yes, rarely and more often than so (1) No, never
	Diet in midlife ^d	How often do you include fresh vegetables in your meal? ^d	(0) At least one meal a day or more often (1) Less often than one meal a day
Index: Health behaviours in midlife			
			The items were weighted using an inverse probability score before being summed to an index

Table 5. Operationalisation of collective efficacy in Studies I and III

Study	Items	Question (cohort 1/cohort 2)	Operationalisation (cohort 1/cohort 2)
Study I	Informal social control	Adults would intervene if somebody is being harassed or bullied	Individual level items were standardised, before being aggregated and summed
	Trust	I worry about being exposed to crime	
	Index: Student derived collective efficacy		
Study III	Informal control	Adults would intervene, even outside the classroom, if the school rules were being broken	Standardised items were added and divided by the number over which the sum was calculated
	Informal control/disorganisation	Graffiti and vandalism are unusual	
	Trust	This is a close-knit school	
	Trust	People at this school can be trusted	
	Index: Teacher derived School collective efficacy		

Methodological considerations

Despite their usefulness, the statistical methods used have weaknesses that need to be taken into account. Fully specified multilevel models, for instance, often contain complicated error structures and should be carefully specified. The complicated structure can also make parameter estimates unstable, and the introduced complexity may also make interpretations of parameters more difficult (Johnson, 2010). Finally, although effective, the distinction between compositional and contextual effects is not in practice as the theoretical division implies (Kaufman, 2006; Macintyre et al., 2002). Some have even questioned whether the distinction is at all meaningful (Oakes, 2004). What is clear is that compositional and contextual effects often interact with each other (Macintyre et al., 2002). It is obvious, for example, that one of the consequences of being poor is that you are also likely to live in a poor area with less resourced schools. The distinction is however important, not least in relation to policy issues. If the differences between schools, for instance, are found to be entirely attributable to student composition, interventions should be focused primarily at the individual level rather than on environmental characteristics, and vice versa (Kawachi & Berkman, 2003; Macintyre & Ellaway, 2003). Nevertheless, for the purpose of the present study the multilevel approach has provided important information. First, the analyses have made clear that schools have an effect on students' health behaviours over and above their personal circumstances and characteristics. The analyses have also made it possible to explore characteristics of the school environment that may contribute to this variation in health behaviours across schools.

Regarding path analysis, it is important to be aware of the strong assumptions on which it rests. For instance, linearity assumptions are made across all relations specified in the path diagram. The interpretation of a path model, and in particular the division of effects into direct and indirect effects, requires correct specification of the model and no unmeasured confounding for any of the components in the diagram. However, as with any other modelling method for observational data, confounding can never be completely ruled out. It is therefore crucial that the assumptions are theoretically justifiable. If treated with care, SEM models (including path analysis) can provide more thorough information about relations between various exposures, outcomes, and mediating variables than many other methods (Arlinghaus, Lombardi, Willetts, Folkard, & Christiani, 2012). However, given the many and strong assumptions, critics claim that it is unlikely that SEM models will produce a completely accurate picture of reality. Sceptics claim that these types of model should therefore be used principally for the purposes of exploratory analysis and hypothesis generation when a broad range of effects

are of potential interest (VanderWeele, 2012). Hence, the model tested in Study IV should be interpreted with care, bearing in mind that it rests on a set of assumptions and that important confounders may have been left out. Nevertheless, a clear strength of Study IV is that the studied relationships have been specified on theoretical grounds. Moreover, it is based on longitudinal data which reduces the risk of false interpretations based on reverse causality.

The empirical studies in this thesis are all based on survey data. This type of survey data is often rich in information but does have drawbacks. Non-response is for instance a common problem that may impair the validity of results. The external non-response rates are usually higher in selected groups. Students who play truant, have low attachment to school or have dropped out of school are, for instance, probably more prevalent in the non-response than in the response group, simply because it is more likely that these students were absent from school on the day of the survey. In similar vein, it is generally the case that people with poor health and of foreign background have greater non-response rates than others, something which may not only bias prevalence rates but also associations (Kelfve, 2015). Another general problem in these types of study is that response rates have declined over the years, thus further increasing the risk of selective responses and less generalisable results. Studies I-III also deal with attrition at school level. This is not a severe problem for the public schools, but among independent schools the non-response rate is high. This may give rise to less generalisable results, at least where independent schools and their students are concerned. Investigations of the non-response/response rates among the independent schools in the Stockholm School Survey (Begler & Sandahl, 2014; Statistikkontor, 2010) suggest, however, that the non-participating schools are small and that the response rates in the participating ones are high, thus to some extent strengthening the validity and the generalisability of the data (Rehnberg, 2013).

A related problem is internal non-response, i.e. missed items. The cumulative effect of missing data on several variables often leads to a reduction in sample size, which in turn can bias parameter estimates. Missed items can also lead to selection bias if the probability of missing information for a particular item is related to some other variable. Those with high alcohol consumption may, for instance, be more unwilling to reveal their real consumption. Internal attrition in the studies of this thesis is quite high, thus possibly calling into question the validity and generalisability of the results in some cases. A number of methods can be used to handle missing data and explore its effects, all of which are associated with various bias/problems (Sterne, White, Carlin, Spratt, Royston, Kenward et al., 2009). In this thesis, missingness has been dealt with in two different ways. In Studies I, II and IV, only complete cases (i.e. those individuals who have no missing data for any of the variables required) were included in the analyses. In Study III, those

with missing information in relation to a variable were kept in the data and analysed as a separate category. When compared to each other (Studies I, II, III), these approaches seem to produce similar results, despite sensitivity analyses suggesting that those with missing on some variable tend to be more disadvantaged (both outcome- and exposure-wise) than respondents included in the study sample. Finally, all data is based on self-reports. Hence, both exposures and outcome variables may suffer from misclassification. In relation to the outcomes, both over- and under-estimation of risk behaviours may have occurred (Begler & Sandahl, 2014; Statistikkontor, 2010) which could have produced unreliable estimates. Moreover, information about family disadvantage is based on youth self-reports, thus possibly introducing self-report biases. Nevertheless, the general agreement between parental occupation reported by adolescents and the parents themselves has previously been found to be good (West, Sweeting, & Speed, 2001).

An important issue in relation to the key measures used in this thesis is that some of the main concepts under study (family disadvantage, health behaviours, school disadvantage) were operationalised and measured differently in the four studies (Table 2-5). In some, each item was used separately, while in others composite measures of related items were used. The disadvantage of using a composite measure is of course that it becomes impossible to differentiate the independent and interactive effects of each component, thus obscuring potentially important information. On the other hand, using several related indicators separately in the model violates the independence assumption and may impose a problem with multicollinearity and unreliable estimates. Focusing only on one single measure or item would have been another option. This would have allowed for a more detailed exploration of pathways. On the other hand, this would have entailed a risk of the used variable would be acting as a proxy for missing variables and thus also causing estimations to be biased. In conclusion, all methods have their advantages and disadvantages that need to be taken into consideration in relation to the purpose of the study. As discussed earlier, the aim of this thesis was not to disentangle the specific pathways of single indicators, but to explore relations between theoretically and empirically derived concepts in a broader perspective. The chosen ways of capturing the measures were therefore deemed appropriate.

Summary of the studies

Of particular interest in the first three studies is how the structural and social characteristics of schools influence young people's health behaviours. In Study I the overarching ambition is to examine whether student alcohol consumption, drug use and delinquency vary between schools in Stockholm, Sweden. Using SDT, the mediating role of school collective efficacy (derived from student assessments) is explored in order to better understand how the ethnic and socioeconomic characteristics of schools influence these types of risk behaviour. The analyses are based on the 2010 Stockholm School Survey, which comprises 5,484 ninth-grade students distributed over 93 schools. Logistic random intercept models were used for this. School disadvantage was determined by combining information about parental education and the share of pupils with a non-Swedish background, two factors that have been shown to be central to school segregation in Sweden. The results indicate significant school-to-school differences for all outcomes. When individual characteristics have been adjusted for, the risk of high alcohol consumption and drug use is greater in more advantaged school settings, while the opposite is true for criminal behaviour. The school's level of student-derived collective efficacy also seems to play an important role. Irrespective of outcome and school characteristics, high levels of collective efficacy reduce the risk of engaging in health risk behaviours. However, it does not mediate the effect of school type. The study concludes that, regardless of an adolescent's own background, the risk of engaging in adverse health behaviours is higher at certain schools than others. However, the results suggest that school socio-economic factors do not influence health behaviours consistently; it rather appears that the association varies depending on the behaviour under study.

Study II explores the indirect effect of schools and school characteristics on youth health risk behaviours. Few studies have examined the extent to which characteristics of schools moderate the impact of known individual or family-based risk factors on youth health risk behaviours. Children not residing with both their parents are usually more likely to be involved in risk behaviours than children in two-parent families. The ambition of this study was to investigate the association between family composition and youth health risk behaviours by combining information about the school and the family contexts. The study examines how aspects of family structure and family processes are associated with youth health risk behaviours and how they

interact with the structural characteristics of schools. The analyses are based on data from the 2010 Stockholm School Survey and consist of 5,002 ninth-grade students distributed over 92 schools. Random intercept and fully random models were used. The results are in line with those of other studies and suggest that adolescents who do not live with both their parents are more likely to be involved in health risk behaviours than those who do. Poor parent-child relations account for more of the disadvantage associated with non-intact family structures than do differences in socioeconomic background. The results further suggest that the detrimental effects of family type and weak parental relationships vary between schools. With regard to poor parent-child relations (but not family type), this was a function of school advantage. More specifically, the results suggest that the detrimental effects of poor parent-child relations on health risk behaviours are accentuated in more advantaged school settings. This supports the social control theory (Hirschi, 1969), which namely proposes that the greatest differences between those with strong versus weak parental relationships are to be found in environments associated with the highest risks. Thus, the results imply that the impact of family risk factors on youth behaviour is susceptible to the contextual effects of schools.

As shown in the first two studies of the thesis, more advantaged school settings appear to have both direct and indirect detrimental effects on adolescent substance use. Although theoretically unexpected, these results support those of other studies in which adolescents' substance use has been found to be more prevalent in socioeconomically advantaged schools and neighbourhoods. However, the mechanisms behind this association are not fully understood. Study III delves deeper into this issue by drawing on theories of social disorganization, social capital and socialisation to expand previous findings on how the socio-demographic characteristics of schools are linked to youth health risk behaviours. The analyses are based on data combining information from the Stockholm School Survey in 2014 (n=5122) and the Stockholm Teacher Survey (n=1104) conducted the same year in 81 senior-level schools in Stockholm. Results suggest that substance use norms are more permissive and teacher-rated collective efficacy stronger in more advantaged school settings. The positive association between school advantage and liberal substance use norms largely seems to depend on a school's share of students with non-Swedish background: the smaller the share, the more liberal the norms. These results complement previous literature on school effects by suggesting that the effect of school collective efficacy on youth health risk behaviours is moderated by school norms about substance use. When individually-held norms and family background have been controlled for, health risk behaviours appear to be most common in schools characterised by high collective efficacy and liberal norms about substance use. This suggests that collective efficacy can have a devastating effect under certain circumstances.

Therefore it is essential to make sure that collective efficacy is framed in a school context of non-liberal norms about substance use.

Finally, Study IV takes a different point of departure. Rather than looking at factors which contribute to the emergence of health behaviours, the role of youth health behaviours in relation to the pathway from social conditions in childhood to adult health is addressed from a life course perspective. The aim was to estimate the extent to which the association between childhood socioeconomic circumstances and adult health is mediated by health behaviours established in youth, and whether this association differs across birth cohorts. By emphasising the influence of time in two distinct ways, the study highlights not only the influence of early and present individual experiences on health but also how such circumstances work together with conditions prevailing during certain historical points in time to affect health. Using path analysis and the panel of the Swedish Level of Living Surveys (LNU), the causal pathways and the direct and indirect associations linking childhood socioeconomic circumstances and midlife health are delineated in two birth cohorts. The results suggest that the relationship between childhood socioeconomic disadvantage, health and health behaviours varies by cohort. More specifically, the social patterning of health, and especially health behaviours, is stronger in the younger cohort. Logically, this should indicate that the studied health behaviours are not equally important mediators of the association between childhood socioeconomic disadvantage and health in the cohorts. Furthermore, by emphasising the individual life course, this study finds evidence of a transmission of disadvantage from parents to children and from childhood to adulthood, at least for the younger cohort. The study also finds a direct effect of childhood socioeconomic disadvantage on adult health for the younger cohort, with a substantial part of this being mediated by educational attainment and health behaviours. This is not the case for the older cohort, in which no direct effect of childhood disadvantage could be found on either health or health behaviours. The study further suggests that it is the cumulative effect of behaviours that is most influential for health. Direct effects of adolescent health behaviours on later health were not found for either of the two cohorts.

Concluding discussion

The ambition of this thesis was to explore the importance of school contextual features for young people's health risk behaviours, and furthermore, to examine the role of such behaviours in the association between childhood socioeconomic circumstances and adult health. In broad terms, the results of this thesis suggest that school contexts do have effects on youth health behaviours. These effects were largely found to be direct, in the sense that regardless of the socioeconomic circumstances of the family, the likelihood of engaging in risk behaviours was greater in some school settings than others. The highest levels of alcohol consumption, drug use and smoking rates were reported by adolescents in more advantaged school settings. School collective efficacy and school norms contributed to this association. The highest levels of self-reported crime were, however, reported by youth in more disadvantaged school settings. The results also indicate that the school context has indirect effects; for instance it moderated the association between poor parent-child relations and youth risk behaviours. More specifically, youths who reported poor parent-child relations were more likely to engage in risk behaviours if they were part of a more advantaged school setting. Finally, youth risk behaviours appeared to operate in an accumulative and indirect manner on later health, rather than directly.

In line with the work of Coleman (1990), an additional ambition was to explore health behaviours as a possible mechanism which links social stratification with population health. In the following, some of the main findings of the thesis, will be highlighted and further discussed using Coleman's graph as the guiding framework. According to Coleman, an association between two social properties, such as social stratification and population health, cannot be properly explained unless the mechanisms at work have been uncovered. The conceptual model presented in the introduction section (Figure 3, p.26) rests on the assumption that social stratification generates certain distributions of material and immaterial resources and values across families and schools. This will influence youth behaviours by differently regulating the opportunities for engaging in behaviours and the reasons for doing so.

Reports and research indicate rising school segregation in Sweden. School populations have become more homogeneous, while differences in attainment between different groups of pupils and between different schools have increased (Skolverket, 2012b). In line with these findings, the results of

this thesis indicate large variations between schools in Stockholm with regards to mean marks, number of highly educated parents and students with non-Swedish backgrounds. Hence, previous research as well as the studies included in this thesis suggests that the structural conditions of Stockholm schools clearly vary. This could challenge the fundamental idea of equity of education. It also suggests that students face differing day-to-day learning environments depending on the type of school they attend

In this thesis it has been suggested that collective efficacy and school norms constitute the mechanisms by which school properties constrain individuals' actions and shape their desires and beliefs about health behaviours, and through this, their reasons for adopting such behaviours – or not. Collective efficacy is a feature of a setting – a structural resource – by which individual behaviour is regulated towards common goals (Sampson et al., 1997). In settings with strong collective efficacy, opportunities for engaging in behaviours which conflict with the group's goal are constrained by conjoint actions of informal control. Collective efficacy is generally defined as the willingness to intervene for what is perceived as the common good. In structurally disadvantaged settings, weak ties among people are believed to impair this willingness. In line with SDT (Sampson et al., 1997; Shaw & McKay, 1942), the findings of this thesis suggest that levels of collective efficacy and its components – trust and informal control – are weaker in more disadvantaged school settings. This suggests that the regulation of behaviours is less effective in these types of setting. In other words, an unequal distribution of social capital in the form of collective efficacy may be one way in which the structural characteristics of schools constrain behaviours differently.

However, collective efficacy is goal-specific (Sampson et al., 1997). The capacity to regulate a certain outcome is not necessarily applicable when it comes to regulating another outcome. The regulation of behaviours rests on the assumption that there are shared beliefs about what the desired outcome is. The prevailing norms about behaviours are thus central to the adequate functioning of the informal control dimension of the collective efficacy concept (Kubrin & Weitzer, 2003). In line with this idea, the results of this thesis suggest that the regulating effect of collective efficacy on youth behaviours varies as a function of the prevailing norms in the school setting. In settings characterised by more liberal norms about substance use, a strong collective efficacy increases the risk of engaging in risk behaviours. It is thus essential to look at both collective efficacy and school norms if one wants to get a fuller picture of the mechanisms by which the characteristics of settings influence preferred actions.

Norms, however, are also likely to influence youth behaviours more directly. According to Peter Hedström (2005), the prevailing norms in a certain environment influence the way people act through their mediating effect on individuals' desires and beliefs. The fact that norms about substance use

vary between settings with different socioeconomic characteristics could thus indicate that the motivation and reasons for engaging in these behaviours differ correspondingly.

A recurring finding of this thesis is that the school environment influences youth behaviours differently. In line with what is postulated by SDT, self-reported crime is found to be more common in disadvantaged schools than in advantaged settings. However, risk behaviours such as alcohol use, smoking and drug use are more prevalent in advantaged school settings. This implies that the choice of whether to engage in these types of behaviour is not associated with lack of resources. It is rather the social and symbolic meaning ascribed to these behaviours which seems to determine whether young people decide to engage in them or not (Johansen et al., 2006). In fact, results from Study II as well as from other research (Pedersen, Andersen, & Sabroe, 2014) indicate that better economic resources increase the risk of substance use by facilitating it.

The choice to engage in these types of behaviour may seem irrational from an objective point of view or from a longer perspective. It is, however, important to recognise that risk behaviours also have desired, positive and sought-after outcomes for youths. As suggested by Jessor (1992), risk behaviours often have important social and personal functions. If substance use, as has been suggested in other studies, is associated with popularity (Allen, Porter, McFarland, Marsh, & McElhaney, 2005; Valente, Unger, & Johnson, 2005) and strong ties to peers (Bergmark & Andersson, 1999; Johansen et al., 2006; Rostila, Almquist, Östberg, Edling, & Rydgren, 2013), an orientation towards these types of behaviour may even be functional (Jessor, 1992). Similarly, Shaw and McKay (Shaw & McKay, 1942) noted that crime rates of disorganized neighbourhoods could be attributed to impaired control functions and the transmission of delinquent values among its citizens.

In conclusion, the results of this thesis suggest that the two explored situational mechanisms – collective efficacy and norms – partly explain how schools' socioeconomic features influence young people's propensity to engage in substance use behaviours. A strong collective efficacy puts constraints on students' opportunities to act. This regulation is impaired in more disadvantaged school settings. Norms affect student behaviour by regulating preferences and thus also their desire to engage in certain behaviours. The findings of the thesis suggest that norms about substance use are more liberal in advantaged schools, thus possibly contributing to the higher prevalence of risk behaviours reported by students in these types of setting. However, these are just two of many conceivable mechanisms. The fact that some of the association between structural school characteristics and risk behaviour remains when the two mechanisms in question are taken into consideration, suggests that other mechanisms may also be at work.

Establishing the link between individual behaviour and social outcome, i.e. the micro-macro transition, is generally recognised as an analytical chal-

lenge in this framework. Lack of sufficient data and lack of theories which connect individual action to social outcomes contribute to the challenge (Sawyer, 2011). In a sense, this thesis deals with the same shortcomings. Nevertheless, a number of conclusions can be drawn about the character of the micro-macro link (arrow three in Coleman's graph). One certain aspect of this transition is that population health and health inequalities are not simply an aggregation of youth health behaviours. The results of Studies I-III suggest that the social determinants of youth behaviour may differ from those determining later risk behaviours (Lynch et al., 1997), or even from the consequences of youth risk behaviours (Gauffin, Hemmingsson, & Hjern, 2013). The results of Study IV, furthermore, demonstrate that health behaviours in youth are not in themselves critical for later health or for mediating the influence of childhood disadvantage on later health. Rather, it seems that the trajectories taken from youth, or the implications of youth health behaviours on school achievement, must also be taken into consideration. The results suggest that youth behaviours influence later health through models of accumulation or chains of risk.

This could indicate that the tracking of health is socially differentiated and that the effects of risk behaviours on health and subsequent trajectories depend on some common factor that influences the severity of the behaviour-induced outcomes. Previous studies have suggested that youth from more vulnerable circumstances may suffer the most severe consequences of poor risk behaviours (Due et al., 2011). In other words, youth with access to protective factors such as a cohesive family and resourceful networks may not experience the same consequences of risk behaviours as their less resourceful counterparts (Jessor, 1992). According to Jessor (1992), it is in contexts characterised by absence of such protective factors "...that risk behaviours are more likely to have irretrievable outcomes, whereas the very same behaviours in a less adverse setting often gain for the adolescent a "second chance" (Jessor, 1992, p.389). Although this study does not make explicit the mechanisms linking individual behaviour to macro outcomes, it suggests that the micro-macro transition from youth behaviour to population health cannot be accounted for simply by aggregating individual behaviours.

A note on policy implications

Obtaining a clearer understanding of the mechanisms which transform social conditions into health behaviours, and ultimately health, is crucial not only for gaining a better theoretical and analytical understanding, but also for gaining insight into potential aspects of interventions (Cohn, 2014). Without behavioural studies, the predispositions of individuals to certain risk factors cannot be understood. For instance, only by understanding how behaviours arise and how social conditions translate into behaviours will it be possible

to direct social interventions where they are needed. It has been suggested that the modest, or lack of, treatment effects found in many intervention programmes, and the difficulties often encountered by interventions aimed at changing people's risk behaviours may, in part, be related to inadequate knowledge about how social conditions translate into behaviours (Emmons, 2000). From such a perspective, what can be learned from this thesis?

The finding that youth behaviours are not directly related to later health indicates that youth is a period during which interventions are still possible. The study findings also implies that rather than focusing on behaviours alone, it may be more beneficial to reduce vulnerability or to add protective factors that could counterbalance the consequences of youth health risk behaviours. The results from Study IV indicate that school attainment may be a central mechanism here. Supporting school achievement among youth at risk is one way to combat the lasting consequences of youth behaviours, and possibly also later health inequalities. The fact that behaviours are found to cluster in certain environments favours broader interventions targeting the contexts in which youth are embedded, rather than targeting the individual. It is also essential to keep in mind that environments that are usually perceived as safe and good may not be uniformly positive. To clarify and combat the processes that encourage risk behaviours in these types of setting it is essential to consider the norms which prevail at school. This might be particularly important for more vulnerable groups such as youth from broken homes and youth with impaired parental relations.

In conclusion, the focus on health risk behaviours should not be interpreted as suggesting that the individual alone is responsible for dealing with risks or combating adverse behaviours. If anything, the results derived from the thesis indicate that the structural and social conditions of the contexts in which youth are embedded influence the behaviours they adopt. These behaviours may not be directly linked to later health consequences, neither may the contexts impact all individuals in the same way. However, there is no doubt that to some degree youth health behaviours are expressions of context(s).

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